RAILROAD GAZETTE

FRIDAY, AUGUST 4, 1899.

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Contributions.

Bridge Building in the United States.

New York, July 17, 1899.

To the Editor of the Railroad Gazette:

No doubt much of our rapidity of manufacture and success in foreign competition is due to the use of standards. It is the old question of division of labor by which it was found expedient for a man to confine his labors to a small part of any product, so that each could produce his part more quickly and accurately, and the whole be brought together and finished by those best qualified for the work. To-day the standards of bridge work represent the several divisions of labor and the whole is assembled and completed under the direction of the trained engineer. The adoption of standards permits the use of machinery, where hand work would be otherwise necessary, and possibly the influence of labor unions abroad, which object to the use of machinery, have indirectly contributed to their loss of work.

The fact that the field of development in America has been broad and new, has required each individual to cover the greatest possible ground, in order to keep abreast of his fellows, and this has permitted and required the adoption of standards in their work. It has been a constant study of how to save time and labor, and this has been most effectively accomplished by the use of standards.

After a standard is once carefully designed and the permanent templates made, the work is done once for all, and the thought and labor is saved on all future work to which it is applicable.

In bridge work the use of standards is not restricted to shops but begins with the specifications, and in the rolling mill. The adoption of a single typical engine, and providing that lighter or heavier loads shall be a stated percentage of this, is of itself the adoption of a standard. Tables are made from it and the moments and shears calculated once for all. These will then be varied by the same stated percentage, when different weights are required. The same tendency extends throughout the specification and to-day special innovations of the individual engineer have become comparatively rare.

The rolling mills have, within the past few years, adopted standard shapes for rolled sections, and this has in turn enabled the designing and draughting departments to design standard details, and to publish them for general use in the form of hand-books. Expensive machines have been built by which the standard details may be punched in the standard rolled beam by one operation, and the same tool punches the bent plates or angles by which the connection is made. It may be readily understood how it would prove more economical to thus punch a standard, rather than make special templates, even of lighter section, for each new piece of work. In addition to this, the chances of error or inaccuracy are greatly reduced. By thus designing a set of standards, once for all, it may be truly said that the bridge is half completed before it is ordered.

H. B. S.

The Westinghouse Brake in Russia.

The Westinghouse Air Brake Company,
Pittsburgh, Pa., July 28, 1899.

To the Editor of the Railroad Gazette:

We have seen published statements, attributed to officers of the New York Air Brake Company, to the effect that that company has secured a portion of the large orders for air-brake equipment required by Russian railroads during the coming 3½ years. We feel justified in stating the facts to you, which are as follows:

It was not until negotiations with the Russian Government had proceeded so far that the business of supplying the brake apparatus for the Imperial State Railroads was practically assured to us, that the Russian [Westinghouse] Company was established and the construction of a manufacturing plant was begun.

About the end of last year, we secured from the Russian Government an order for about $2,000,000 worth of air-brake material for the State Railroads. During January of the present year a congress of representatives of the rolling-stock departments of all the private as well as the Government railroads was called, and after extended deliberation, the Westinghouse quick-action air-brake system was adopted as the standard for all railroads, private and State.

On the 5th of June, an imperial decree was issued which announced and ordered that

(1) All freight locomotives and tenders, and a sufficient number of freight cars to secure brake control of all freight trains within the Russian Empire, must be equipped with air-brake apparatus prior to January 1, 1903.

(2) The Westinghouse air-brake has been adopted and must be purchased for this purpose by all roads, private and State.

(3) The use of any other kind or make of air-brake than the Westinghouse is prohibited, with the provision, however, that a trial of any other brake system may be made, in connection with the Westinghouse, upon local trains. Each such trial must be conducted, under the direction of the Imperial Brake Commission, for a period of at least three years, after which the suitability of the brake so tried must be considered by a congress of rolling-stock representatives of all the railroads, and the conclusions of this congress must thereafter be submitted to Imperial ratification before any such brake can be used in general service.

In view of the facts above stated, it will be perfectly clear that any statement to the effect that we have not secured the Russian air-brake business, or that the New York Air Brake Company has secured or can secure any portion of the enormous air-brake business during the next 3½ years in the Russian Empire, is and must be entirely without foundation. The use of the New York Air Brake Company's apparatus is not only not contemplated upon any railroad in Russia, but is expressly prohibited for at least three years to come, except for experimental purposes upon local trains, under the permission and direction of the Imperial Brake Commission.

We have in our possession a translated copy of the Imperial Decree of June 5, which we shall be pleased to submit to your perusal in verification of the above statements.

It gives us pleasure to add that the demands for the output of our Russian plant, to comply with the requirements of the Imperial Decree, necessitate its immediate enlargement to double its present capacity, and we have taken steps in that direction. It is estimated that we shall be required to supply air-brake fixtures for about 350 locomotives and tenders and 1,750 freight cars per month, during the next 3½ years.

H. H. WESTINGHOUSE,
General Manager.

Bezer's Revolving Signal.

Kingsland, N. J., July 25th, 1899.

To the Editor of the Railroad Gazette:

In your issues of June 14, 1895, and June 26, 1896, you kindly published descriptive matter relating to railroad signaling, and to my revolving signal.

Since then I have had in operation on the Delaware, Lackawanna & Western three of the revolving signals. The test having extended during nearly four years, I have had the opportunity to accomplish what is, I think, absolutely necessary in a railroad signal, viz., no dependence upon automatic mechanism in any part of the system to change the signal from the indication of safety to that of danger. This I will presently more fully explain.

It cannot be denied that any form of position signal must so depend. In some, after the train cuts out the track battery a track relay has to automatically release its armature, and this has to be followed by the automatic action of the counter-weight. In others, the release of the track-relay armature must be followed by the automatic release of the slot, to be followed by the automatic action of the counter-weight. The electro-pneumatic system calls for the same automatic release of the track-relay armature, to be followed by the automatic closing of a valve, to be followed by the automatic action of the counter-weight. Under such systems the traveling millions are dependent upon two conditions. One is that outside forces, tending to oppose these automatic actions, shall not come in; the other is the perfect performance of his duty by the maintainer. These facts are conceded by The Union Switch & Signal Company in their pamphlets issued in December, 1897. (Railroad Gazette, March 25, 1898.)

I unhesitatingly refer to an attack by lightning on my unimproved signal at Kingsland on the D., L. & W. on Saturday last. The said signal had passed through the storms of nearly four years, but finally the track-relay points welded, leaving in consequence the signal of safety behind a train. This possibility is common to all signals hitherto introduced, and lightning is but one of the possible outside forces tending to oppose automatic action. I am aware that relays are in use, constructed to counteract the effects of lightning, but in these there are connections which must be properly maintained, and which must remain intact. They might not be there when wanted. I am aware that carbon points are being introduced, but I think it will be conceded that they are not reliable unless with very high potential. This multiplies cells of battery, consequently increases connections, and calls for increased battery space; both features are undesirable, besides adding to cost.

I invite your readers to inspect by appointment my improved revolving signal, which is now set up in a New York factory, where every detail of the mechanism can be more easily and comprehensively examined than on the railroad. The welding of any part by lightning is next to impossible, but should it occur, it would at once put the signal to danger. The following outlines the improvements and capabilities of the signal:

1. No dependence upon automatic mechanism to change the signal from the "safety" indication to that of "danger." The signal is a revolving signal. As the train enters the block ahead of the signal and while in the said block, it cuts out the track battery. This is a fixed electrical law, and can be depended upon. Then the signal ceases to revolve. Its last revolution mechanically forces all mechanism in the system to the required condition for the "danger" indication. As the motion of the signal indicates "safety," should the motion to force the mechanism as above described fail, the signal is a "danger signal" because it is not in motion. Therefore failure from any source or cause can only indicate "danger."
2. Foreign currents (say trolley currents) are powerless to block or unblock the road. It is therefore impossible for a foreign current to cause a signal to indicate "safety" behind a train. This is accomplished without any extra contact points, relays or insulated rail joints.
3. The circuit does not require any line wire; but if an overlap is supplied a line would be wanted for its distance.
4. Permissive block is safe as regards the signaling system, because it is impossible for a signal to remain at "safety" behind a train.
5. The motor circuit is opened at a point distinct from that at which it is closed. The opening point is never wanted to close the motor circuit. Therefore the injurious effects of sparking are entirely prevented.

Mr. A. Reasoner, late Superintendent of the Delaware, Lackawanna & Western, has given me the following testimonial, dated Nov. 9, 1898:

I can state that your revolving signal has worked satisfactorily during a long-time test on our Boonton Branch; and I consider it will fulfill all you claim for it. The feature peculiar to your signal, namely, no dependence upon automatic mechanism to change it from the indication of safety to that of danger, is, in my opinion, all important. This company is not purchasing signals at present; meantime I have your prices before me.

An inspection of my improved signal will prove that the foregoing claims are truly stated, and I should be much favored if you will print them in full.

HENRY BEZER,
Signal Engineer.

Mr. Hewitt on the Canals of New York.

The reader will remember that some two or three months ago a special committee on the Canals of the State of New York asked expressions of opinion from certain citizens, having special knowledge, on various propositions as to the treatment of the canals of the State of New York. A letter has just been published which Mr. Abram S. Hewitt addressed to this committee as his contribution to the discussion. We print his letter nearly in full below, preceding it by the five suggestions made by the committee.

First—To complete the present project of enlarging the Erie, Oswego and Champlain Canals at a further cost of $15,000,000 (or $24,000,000 in all).

Second—To enlarge the present locks of the Erie Canal at once to a length of 200 feet, a width of 26 feet and a depth of 11 feet, making them suitable for boats 25 feet wide, 125 feet long and 10 feet draught. This project would cost about $6,000,000.

Third—To construct a barge canal continuously descending all the way to the Hudson River from Lake Erie, with a depth of 12 feet, and suitable for barges of 1,200 to 1,500 tons, which can be towed on the Lakes if desired. The cost of this is approximately estimated at $50,000,000.

Fourth—To construct a ship canal with a depth of 20 to 30 feet, suitable for Lake and ocean vessels of 5,000 to 10,000 tons capacity. The cost of such a ship canal, depending upon its size and route adopted, is estimated at from $200,000,000 to $500,000,000.

Fifth—To abandon the canals entirely, as has been done in some other States, and dispose of the property interests therein to private individuals or corporations on the best terms that can be secured, or to make some other use of the property for the benefit of the State.

I was brought up in a school of politics which taught that the prosperity of the State of New York was created by the canals, and could not be maintained unless they were kept in a condition of perfect efficiency. Hence, whenever occasion has arisen, I have been a warm advocate of all expenditures upon the canal proposed to the Legislature or to the people of the State of New York. I also advocated the abolition of tolls and the maintenance of canals as a free water way at the expense of the State. My view was that the people of New York would gain far more than the actual expenditure of a million of dollars required for the operation and maintenance

of the canals. I think the result has justified this belief, and that the enlightened policy followed by the State has fully justified the expenditures which have been made up to the present time. When the proposition was made to still further enlarge the canals by an expenditure of nine millions of dollars I was in favor of the constitutional amendment, and did what I could to secure its adoption.

Since this expenditure was approved and undertaken two things have occurred which compel a reconsideration of the whole question. The first was the discovery that the estimate of nine millions of dollars was altogether inadequate for the work to be done. This discovery came as a great shock to the friends of the canal, and has very properly banished from public life all the incompetent or dishonest men who were engaged in this fraudulent misrepresentation of the facts.

The question assumed a new phase when fifteen millions of dollars additional were declared to be necessary to complete the improvement which was estimated originally at a cost of nine millions of dollars. If this expenditure be made, the annual charge upon the people of this State for maintaining the canals and for the interest upon the debt will be not less than two millions of dollars per annum, thus doubling the burden which has heretofore been borne cheerfully by the people of the State of New York. If the proposition had been made originally to expend twenty-five millions of dollars and create the additional burden of interest, I am inclined to believe that the citizens of New York would have approved of it.

But a new condition has appeared in the great reduction of the cost of transportation by the railroads which compete with the canal for business. No one could have believed it possible for a cost of railroad transportation to be reduced to three mills per ton per mile. This figure has undoubtedly been reached, and there seems to be good reason to expect that further economies will bring the cost down to two mills per ton per mile.

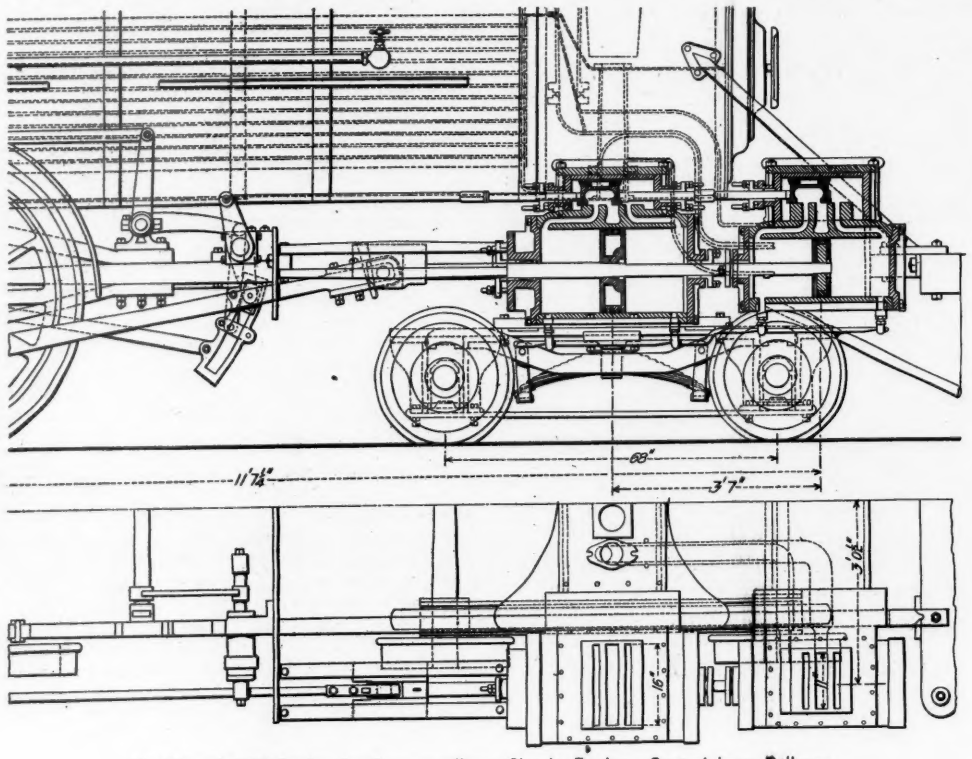
Unless, therefore, the maintenance of the canal is necessary to insure to the public transportation by rail at this low cost, there is no longer any reason why the people of the State of New York should bear the burden of maintaining a free waterway from the lakes to the ocean.

My knowledge of the subject inclines me to believe that we have reached a permanent era of low cost of transportation by rail. I doubt whether the rate can ever be advanced beyond the present limits, because such an advance in the cost of transportation would restrict the export of our products, which is essential for the permanent prosperity of the railroads themselves.

Hence the question is presented in altogether a new light, and although I am reluctant to come to the conclusion that the canals have lost their usefulness, I confess frankly that the argument for their continued maintenance is greatly weakened, if not altogether destroyed. I am not prepared at this time to recommend the expenditure of fifteen millions of dollars, for which there will be no return to the State, except the possible insurance of the present low rates of transportation by rail. It seems to me that the rate of insurance is too high, and that it will be better to continue the canals as it is for a few years longer, when it will become apparent whether there is any real inducement to spend money for their enlargement in order to keep railroad rates in check.

I confess I am somewhat surprised at the conclusion I have reached, against all my preconceived ideas and contrary to my inclination to preserve the canal as the permanent memorial of the great men by whose foresight and sacrifice it was originally constructed. When the canal was proposed, John Stevens of Hoboken, in his remarkable address to the Legislature, predicted that if it should be constructed the time would come when its channel would be used for a roadbed for future railroads. This prediction seems about to be realized in effect, if not in letter.

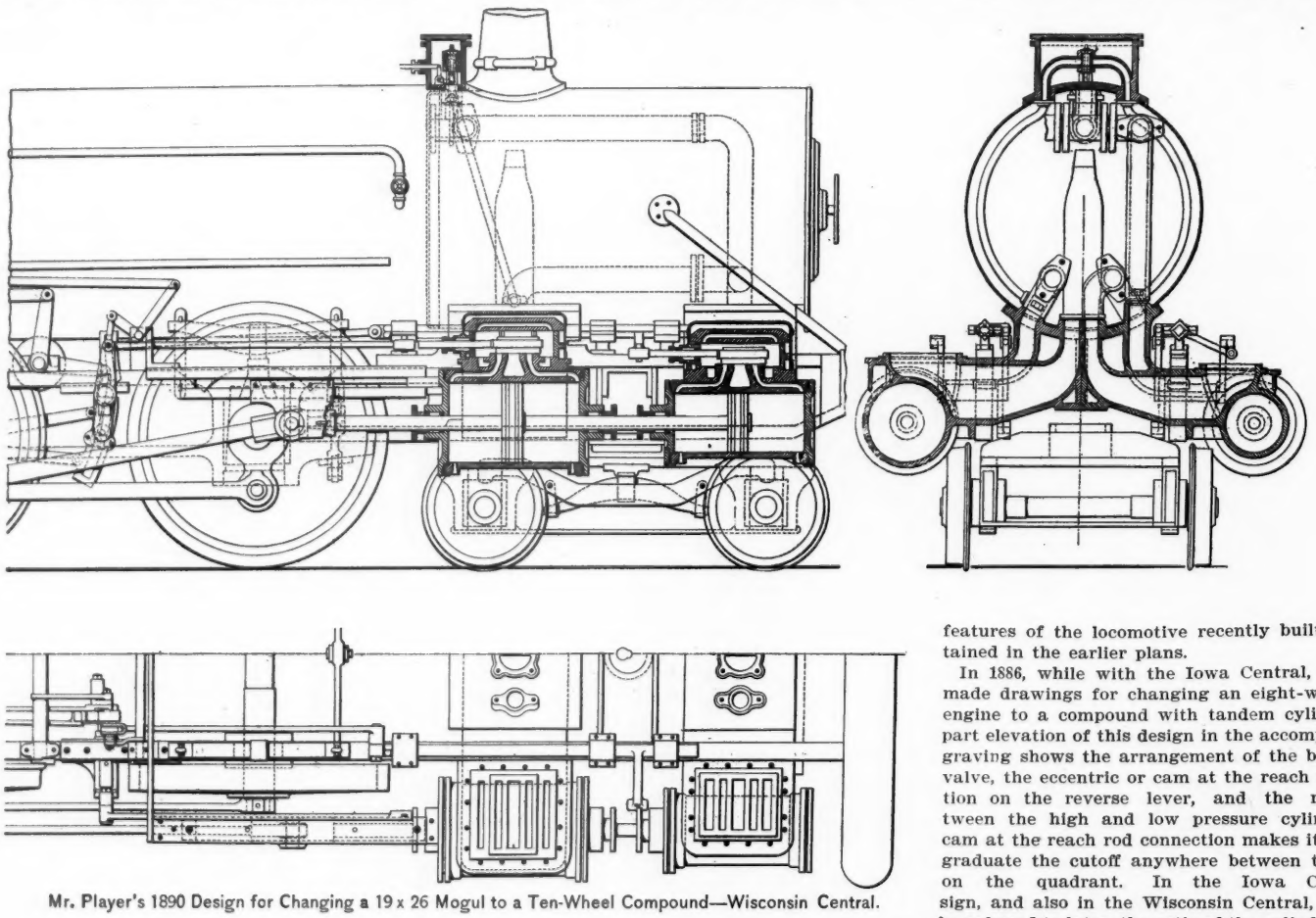
My conclusion, therefore, is, unless I shall be better advised by the views which may be presented to your committee, and by the report which you will frame, that there seems at present to be no justification for the expenditure of any considerable sum of money by the people of this State for the enlargement of the existing canals. Whether in the future the State shall part with the canals and rescue any portion of its investment from the wreckage is a question which I do not think it necessary to discuss at this time, because with the close of the century the canal account can be closed, with a balance to the credit side unprecedented in governmental operations.



Mr. Player's 1886 Design for Compounding a Simple Engine—Central Iowa Railway.

Early Player Tandem Compounds.

The description in our issue of June 16 of the Atchison, Topeka & Santa Fe tandem compound locomotive, designed by Mr. John Player, Superintendent of Machinery of that road, is hardly complete without a brief reference to former tandem compound designs of Mr. Player, inasmuch as many of the features of the locomotive recently built were contained in the earlier plans.



Mr. Player's 1890 Design for Changing a 19 x 26 Mogul to a Ten-Wheel Compound—Wisconsin Central.

In 1886, while with the Iowa Central, Mr. Player made drawings for changing an eight-wheel simple engine to a compound with tandem cylinders. The part elevation of this design in the accompanying engraving shows the arrangement of the balance slide valve, the eccentric or cam at the reach rod connection on the reverse lever, and the receiver between the high and low pressure cylinders. The cam at the reach rod connection makes it possible to graduate the cutoff anywhere between two notches on the quadrant. In the Iowa Central design, and also in the Wisconsin Central, which will be referred to later, the ratio of the cylinders is practically 1:2, while in the A., T. & S. F. compound the ratio is practically 1:3. This Iowa Central engine, which was the first of Mr. Player's designs for changing simple to tandem compound, was not built, for he went to the Wisconsin Central soon after the drawings were made, where he prepared plans for changing a 19 in. by 26 in. mogul, simple, to a tandem compound 10-wheeler with cylinders 13 in. and 26 in., a part of the general elevation of which is shown in the accompanying engraving.

The Wisconsin Central design shows some changes and improvements over the remodelled Iowa Central engine. In the former, the idea of making the variable travel for the high and low pressure valves was carried out. Although the principle as worked out in the compound just completed for the A., T. & S. F. road is the same as that for the Wisconsin Central, it did not have the hollow valve stem as adopted in the later design described in our issue of June 16. The cylinders of the 1890 design were to be placed in the usual order for this type, the high pressure cylinders in front and the low pressure cylinders cast with an independent saddle in the rear of the saddle which carries the high pressure cylinder. Before the designs of Mr. Player for rebuilding the Wisconsin Central engine were carried out, he left the road.

In the engraving of this design is shown the rocker shaft with two upwardly extended arms, on one of which is a movable block worked with a bell crank and with a rod to the cab for giving the variable travel on the high pressure valve. The auxiliary throttle in the steam box over the niggerhead, where steam pipes lead to the high pressure cylinder, is also shown. This auxiliary throttle was for admitting live steam directly to the low pressure cylinder.

It will be apparent from a study of the accompanying designs and comparing them with the 999 of the A., T. & S. F. road, in our issue of June 16, that the engine as finally built was simply a development of designs worked out for other roads and reaching back to 1886.

Kind of piston rod packing	Metallic
Valves, kind of	American balanced
Boiler, type of	Extended wagon top
" material in barrel	Steel
" thickness of material in barrel	5/8 in.
" diameter of barrel	62 in.
Thickness of throat sheet	11/16 in.
Crown stayed with	1⅛ in. radial stays
Dome, diameter	30 in.
Firebox, length	9 ft. 0 in.
" width	2 ft. 9¼ in.
Tubes, number	334
" outside diameter	2 in.
" length over sheets	12 ft. 0 in.

Tender.

Type	Swivel trucks
Frame	Oak
Tank capacity for water	4,500 gals.
Coal capacity	9 tons

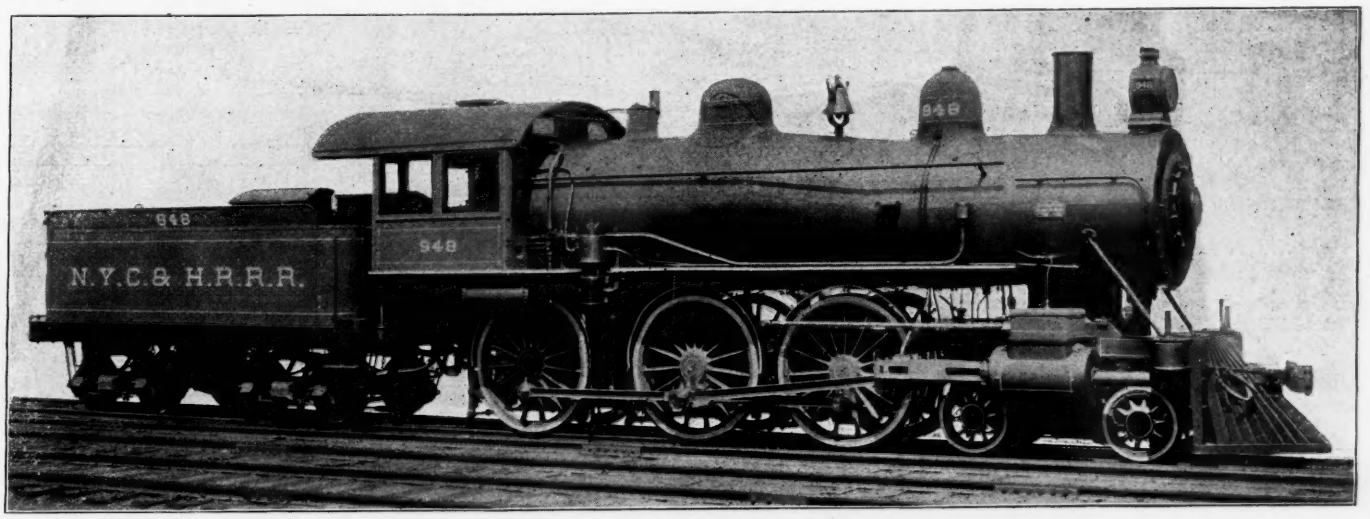
Special Equipment.

Injectors	Ohio
Bell ringer	Golmar
Brakes	Westinghouse
Metallic packing	United States

Greatest travel of slide valves	5½ in.
Outside lap " " "	1 in.
Inside " " " "	0 in.
Lead of valves in full gear	0 in.
Kind of valve stem packing	United States

Wheels, Etc.

Diam. of driving wheels outside of tire	70 in.
Mat'l " " " centers	Cast steel
Tire held by	Shrinkage and retaining rings
Driving box material	Cast steel
Diam. and length of driving journals	9 in. dia. x 12 in.
" " " " main crank pin journals,	6 in. dia. x 6 in.
" " " " side rod " " journals,	Main side 6¾ in. x 5¼ in., F. & B. 5 in. dia. x 3¾ in.
Engine truck, kind	4-wheel swing bolster
" " journals	6¼ in. dia. x 10 in.
Diam. of engine truck wheels	33 in.
Kind " " " "	Krupp steel tired spoke No. 3, with 2⅝ in. tire



New York Central Ten-Wheel Passenger Locomotive—Built by Schenectady Locomotive Works.

New Passenger Locomotives of the Pittsburgh & Western Railway.

The accompanying engravings show the new eight-wheel passenger locomotives designed by Mr. F. T. Hyndman, Master Mechanic of the Pittsburgh & Western, two of which have recently been built by the Pittsburgh Locomotive Works. Both engines are hauling the limited and express trains, consisting of from six to ten cars, between Pittsburgh and Akron, making an average monthly mileage of 8,160 miles. For a short time they were used to haul excursion trains between Allegheny and Maple Grove, and in one instance with a train of 16 loaded coaches a stop for water was made at the foot of a long 1½ per cent. grade, but the engine was able to start the train and take it over the summit unassisted. On another occasion when hauling 12 loaded coaches a full stop was made on a similar grade on account of being flagged, but the train was started unassisted, and the summit was passed at a speed of 18 miles an hour. The profile of the Pittsburgh & Western is generally level with the exception of these.

The front ends of these locomotives are of moderate length, being 38½ in. from the center of the exhaust to the front of the smokebox. When the engines were delivered by the builders, the exhaust nozzles were 5¼ in. in diameter, but it was found advisable to change first to 5½ and then to 5⅝ in. nozzles. With the large nozzles the exhaust from these engines, when worked hard, is unusually mild.

The principal demensions are as follows:

Gage	4 ft. 8½ in.
Kind of fuel used	Bituminous coal
Weight on drivers	89,000 lbs.
" " truck wheels	44,000 lbs.
" total	133,000 lbs.
" tender loaded	92,750 lbs.
Wheel base, total, of engine	23 ft. 8 in.
" " driving	8 ft. 6 in.
" " total, engine and tender	50 ft. 5 in.
Length over all, total, engine and tender	62 ft. 4 in.
Height, center of boiler above rails	8 ft. 6 in.
" of stack, above rails	14 ft. 9¼ in.
Heating surface, firebox	164.1 sq. ft.
" " tubes	2,097.5 sq. ft.
" " total	2,261.6 sq. ft.
Grate area	24 sq. ft.
Drivers, diameter	70 in.
" material of centers	Cast steel
Truck wheels, diameter	32 in.
Journals, driving axle, size	9 x 11 in...
" truck " "	6 x 10 in.
Cylinders, diameter	20 in.
Piston, stroke	26 in.

Schenectady Ten-Wheel Passenger Engines for the New York Central.

We announced some months ago that the Schenectady Locomotive Works would build ten heavy ten-wheel passenger engines for the New York Central & Hudson River Railroad. Five of these have been completed and are giving good results on the Hudson River Division, where all will be run when completed.

We are enabled now to show an engraving from a photograph of one of these engines and to give the descriptive specifications. The cylinders are 20 in. x 28 in. The engines carry 126,000 lbs. on the drivers and weigh, complete, 164,000 lbs. The boilers are designed for 200 lbs. working pressure, the total heating surface is 2,886 sq. ft. and the grate surface 30.32 sq. ft.

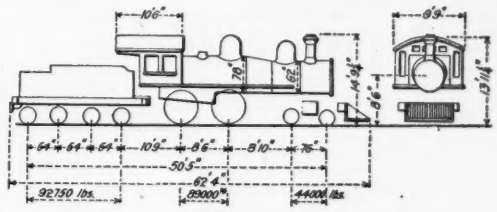
The tractive power of the engine in starting is 27,200 lbs. One of the special features is the liberal bearing surfaces, as will be noted from the accompanying specifications. It will also be observed that the engine has a very large heating surface.

Schenectady Ten-Wheel Passenger Locomotive for the New York Central.

Gage	4 ft. 8½ in.
Fuel	Bituminous coal
Weight in working order	164,000 lbs.
" on drivers	126,000 lbs.

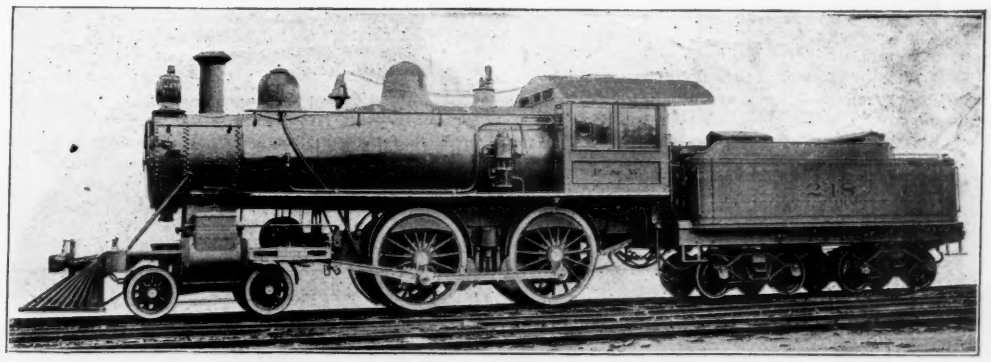
Boiler.

Style	Extended wagon top
Outside diam. of first ring	66 5/8 in.
Working pressure	200 lbs.
Mat'l of barrel and outside of firebox	Carbon steel
Thickness of plates in barrel and outside of firebox,	11/32 in., 3/4 in., 1/2 in. and 11/32 in
Horizontal seams	Butt joint sextuple riveted, with welt strips inside and outside
Circumferential seams	Double riveted



P. & W. Eight-Wheeler.

Firebox, length	108⅛ in.
" width	40⅜ in.
" depth	F. 83⅛, B. 71⅛ in.
" material	Carbon steel
" plates, thickness	sides 5/16 in, back 5/8 in., crown 5/8 in., tube sheet ½ in.
" water space	4½ in. front, 3½ in. sides, 3½ in. to 4½ in. back
" crown staying	Radial stays 1⅛ in. diam.
" stay bolts	1 in. diam.
Tubes, material	Charcoal iron No. 11
" number of	360
" diam.	2 in.
" length over tube sheets	14 ft. 4 in.
Heating surface, tubes	2,685.99 sq. ft.
" " water tubes	12.64 sq. ft.
" " firebox	187.53 sq. ft.
" " total	2,886.16 sq. ft.
Grate "	30.32 sq. ft.
" style	Rocking, with dumps N. Y. C. style



Eight-Wheel Passenger Locomotive—Pittsburgh & Western Ry.

Wheel base, driving	14 ft. 8 in.
" " rigid	14 ft. 8 in.
" " total	26 ft.

Cylinders.

Diam. of cylinders	20 in.
Stroke of piston	28 in.
Horizontal thickness of piston	4½ in. and 5 in.
Diam. of piston rod	3⅜ in.
Kind " " packing	3 cast iron rings
" " " rod packing	United States
Size of steam ports	18 in. x 1¼ in.
" " exhaust "	18 in. x 2¾ in.
" " bridges	1⅛ in.

Valves.

Kind of slide valves	American balanced
Ash pan "	Sectional dampers front and back
Exhaust pipes	Double high
" nozzles	3¾ in., 3⅝ in., 3½ in. diam.
Smoke stack, inside diameter	16½ in.
" " top above rail	14 ft. 9¼ in.
Boiler supplied by	2 Monitor injectors, size No. 10

Tender.

Weight, empty	45,500 lbs.
Wheels, number of	8
" diam.	33 in.
Journals " and length	4½ in. dia. x 8 in.
Wheel base	15 ft. 10 in.
Tender frame	10 in. channel iron
" trucks	4-wheel N. Y. C. standard, side bearings F. & B.
Water capacity	4,500 U. S. gallons
Coal "	10 tons

Total wheel base of engine and tender.....52 ft. 8¾ in.
Engine equipped with 3 3 in. Consolidated safety valves; Westinghouse-American brake on drivers, tender and for train; Westinghouse 9½ in. air pump and engineer's air signal. Tender fitted with water scoop.

Instructions of the Eastern Railroad of France as to Compound Locomotives.

The July Bulletin of the International Railroad Congress contains the directions of the Eastern Railroad of France to its enginemen concerning a new style of four-cylinder compound. These instructions are very full and include an explanation of the principle of compound engines, and the functions of the several valves and levers used in its new engines. Drawings showing sectional views with the parts lettered help to make these explanations clear and concise. It is rather a discussion of the management of compound locomotives than an ordinary set of rules.

The locomotives described have two high-pressure cylinders outside the frames which drive the second coupled axle, and two low-pressure cylinders between the frames, and underneath the smokebox, which drive the forward coupled axle. There is a receiver between each pair of cylinders, the pressure in which is shown on a gage in the cab. The starting arrangement consists of a valve on the side of the dome, worked by a handle in the cab, through which live steam can be admitted to the receivers. Safety valves on the receivers are set at 85 lbs. A second lever in the cab works two valves on each of the high-pressure exhaust pipes, so that the exhaust steam from the high-pressure cylinders can be made to pass direct into the air, at the same time cutting off communication between those cylinders and the intermediate receiver.

This arrangement gives four different modes of working: First, as a compound when the starting lever is pushed backward into the compound position, and steam is admitted by the throttle alone. Second, working as two independent engines when the starting lever is forward and the steam acts direct on the four pistons, being admitted into the high-pressure cylinders by the throttle and into the low-pressure cylinders by the special by-pass valve; each group has independent exhausts. Third, working with the small cylinders only, which is the same as the preceding case with the by-pass valve closed, so that no steam is admitted to the large cylinders. Fourth, working with the large cylinders alone, which is the same as the second case excepting the throttle is closed and the special starting valve opened.

The working of the reversing gear, which is illustrated by an engraving, is explained in detail, as well as the LeChatelier water brake with which these particular engines are provided.

It is stated that the volume of the large cylinders is about 2.5 times that of the small cylinders of these engines. As the exhaust closes a little before the piston has reached the end of its stroke, this exhaust volume is a little less than that of the small cylinder and consequently it is desirable that the volume of steam admission in the large cylinder should be at least equal to the volume of the small cylinder. The instruction is therefore given that the cut-off of the large cylinders should never be less than 40 to 45 per cent. As to the limiting cut-off in the high-pressure cylinders, it is stated no hard and fast rule can be made. However, it is said to be a disadvantage from an economical point of view to make the cut-off in the small cylinders less than from 20 to 25 per cent. If such a cut-off is found to develop too much power, it is recommended that the speed be regulated by the throttle. When running with the throttle closed, the valves are to be put in full gear and the cylinder cocks opened.

Various kinds of accidents are described, disabling one set of cylinders, to illustrate how the engine can be worked with the high or low-pressure cylinders only. This, it will readily be seen, is possible with the arrangement of starting valve used.

The Scherzer Rolling Lift Bridge Over the Fort Point Channel, Boston.

The Scherzer rolling lift bridge, which has just been completed at the Fort Point Channel, Boston, is an engineering work of particular interest. This bridge is over the channel where the Plymouth Division of the New York, New Haven & Hartford Railroad enters the yard of the terminal station, and the engraving, Fig. 1, is a view looking toward the new South station. In this view two of the lifts are in a vertical or open position and one in a horizontal (or closed) position. The reader is doubtless familiar with the history and development of this type of bridge as patented in 1889 by Mr. William Scherzer. The Boston bridge was built by the Pennsylvania Steel Co., of Steelton, Pa., under the direction of Mr. Fred Borg. It consists in fact of three bridges side by side, a distance of 29 ft. 6 in. center to center, with two tracks on each bridge.

Each lift is worked independently by a 60 h. p. Westinghouse railroad-type motor, the movements being controlled at an operating tower, shown in Fig. 3, in the center of the six tracks. The average time to operate the bridge one way is 35 seconds, which later may be somewhat shortened.

There are three operating struts which are controlled from the operating house shown in the elevation, Fig. 3. Each of these struts can be controlled independently or all can be worked together, moving the three bridges at once, and as stated each is operated by a 60 h. p. Westinghouse motor. On the lower portion of each of the operating struts is a rack which runs on the pinion in the place marked "operating machinery" in Fig. 3, and as this wheel is turned the operating strut is drawn toward the operating house and the bridge rolls over on the rolling segment as shown in the engravings. The reverse takes place when the bridge is lowered, it requiring power to lower as well as to raise the bridge. The radius of the segment on which the lifts roll is 26 ft.

The bridge is of the lattice truss type with inclined posts and vertical hangers, and each lift has two unequal trusses, A and B, with lengths respectively of 113 ft. 10 in. and 83 ft. 9 in. These trusses are shown on the general plan, Fig. 3. The width of each is 27 ft. 2 in. center to center of chords. The height above spring tide to the base of the rail is 10 ft. 3 in. The height of the truss at the counterweight end is 45 ft. 9 in., which is 10 ft. higher than the bridge at the first panel. The clearance throughout is 21 ft. 6 in.

There are in all five panels with spacings of 15 ft. 1 in. and 12 ft. 9¾ in. A civil engineer of Boston, referring to the trusses states that they "have an appearance of symmetry and solidity, due somewhat probably to the proportion of the gusset plates to the connecting pieces, of which the posts are 15¼ in. x ⅜

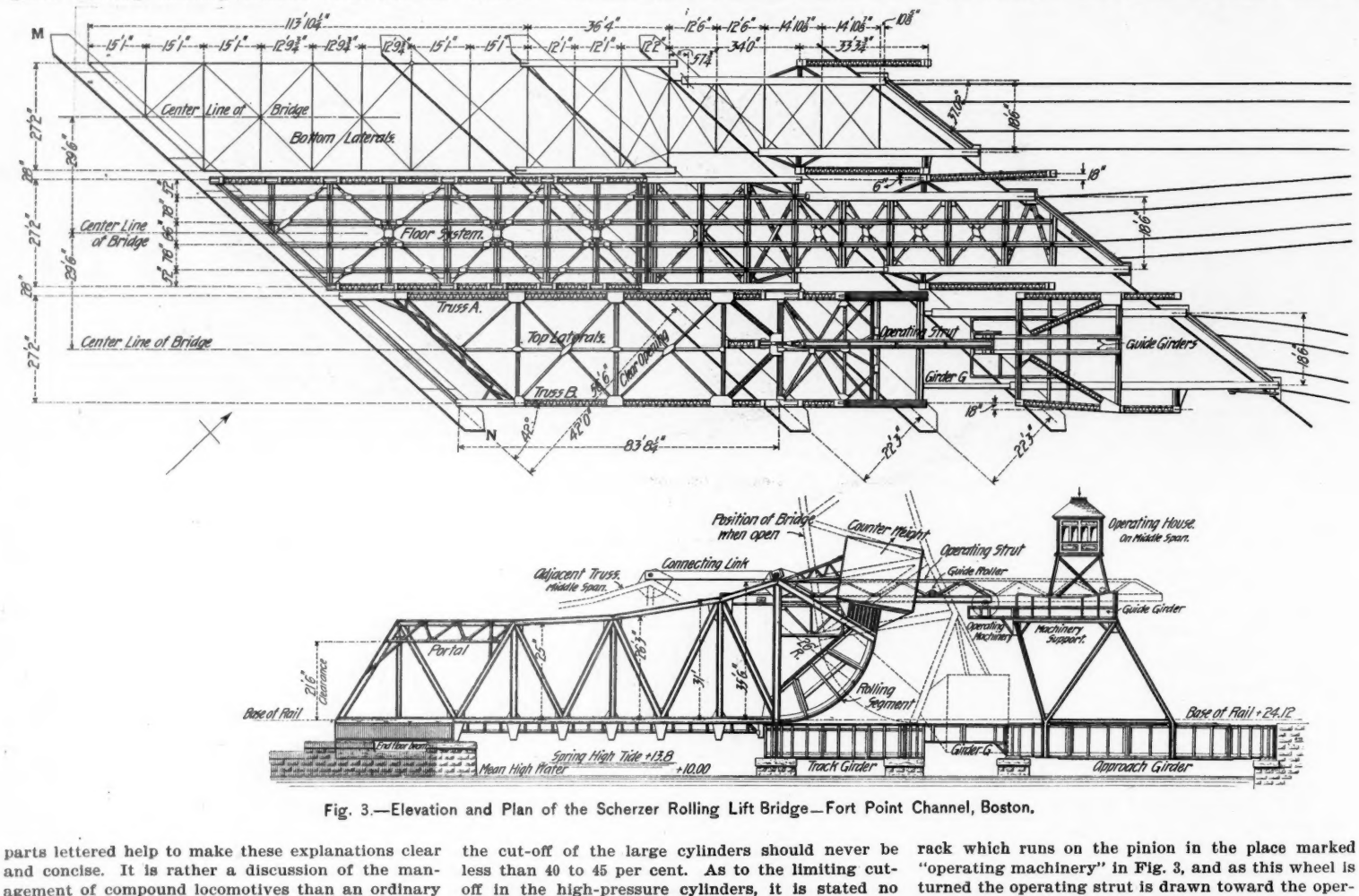


Fig. 3.—Elevation and Plan of the Scherzer Rolling Lift Bridge—Fort Point Channel, Boston.

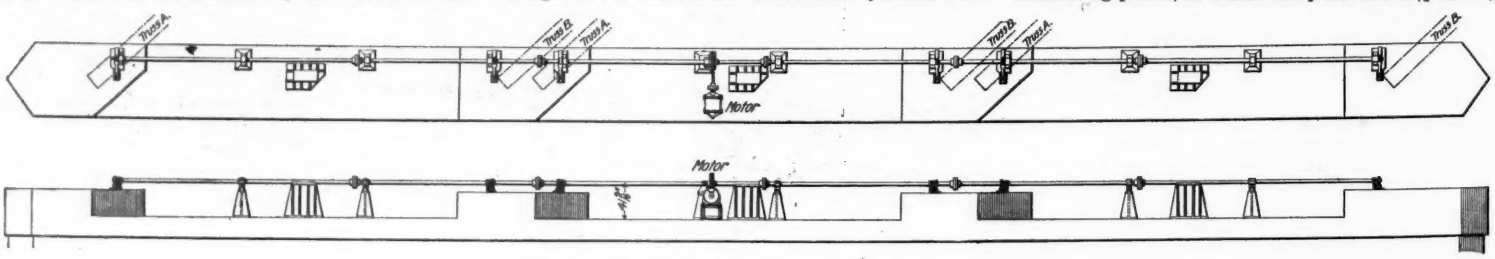


Fig. 4.—Locking Device of the Scherzer Lift Bridge.

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The locking device is shown in Fig. 4. This consists of a shaft about 105 ft. in length placed on the pier along the line M N in the general plan view of Fig. 3. This shaft is turned by a small motor and operates by gear wheels and six bolts which fit in eyes on the trusses A and B, as an ordinary pin and

eye. This movement is controlled from the operating house and the motor is connected up so as to make a certain number of revolutions when the current is turned on, which is just enough to force the pins into the eyes, locking the bridge securely.

One of the interesting features of the bridge is the method in which it is counterweighted. The counterweight frames are well shown in Figs. 2 and 3. These are 18 ft. 4⅛ in. x 22 ft. 5 in. for the A truss and 20 ft. 3 in. x 18 ft. 4 in. for the B truss. The weights themselves, which are 99 in number, are each 24 in. square

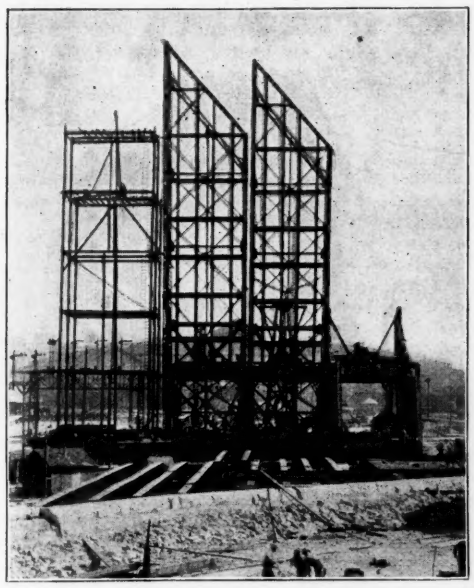

Fig 1. - Scherzer Lift Bridge—Boston.

x 12 in. and 9 in. thick and weigh 1,800 lbs. and 1,300 lbs. in the A and B trusses respectively. As shown in Fig. 2, they are held in place by a center bolt. The positions of the bridge when open, and of the counterweight, are shown in the dotted lines, Fig. 3.

The total weight of the three lifts is 1,143,350 lbs. The A truss carries 644,050 lbs. and the B truss 499,300 lbs.

The above brief description and the accompanying engravings should give a fair notion of the dimensions and the principal features of the bridge. For clearness of the main part is shown, many of the details of the driving machinery have been omitted in the outline drawings. Later we expect to give a more detailed description.

The Function of a Railroad Testing Laboratory.*

In a broad way, it is the province of the chemist to assist the purchasing agent in selecting such material for the company as will give the maximum efficiency of service at the minimum cost. With this end in view, the work in the laboratory may be separated into three broad divisions: First, determining the chemical and physical characteristics of the supplies best adapted to the requirements, and covering these points by specifications; second, the routine work of examining shipments bought on these specifications, to determine whether they conform to the requirements; third, experimental work and investigations.

The specification is a vital point; indeed, it is the backbone of the entire structure, as it is the goal toward which all the investigation and experimental work tends. Consequently, before the results of the investigation can be embodied in the official form, much experimental work must be done, and many practical tests made.

As an example, take the single instance of steel used for firebox and boiler plate. Samples are sent to the laboratory from locomotives as they come into the shop for repairs, with as complete a history as possible in each case; length of time in service, mileage, character of water used and present general condition of the steel; or, in brief, if the service has been satisfactory, and how the result has been affected by peculiar conditions. Then from chemical analysis and physical tests of each sample attempts are made to deduce what are the chemical and physical attributes which give to each its peculiar character. It is of the utmost importance to draw conclusions from a large number of widely different cases, and eliminate the variables of personal equation and special conditions as much as possible.

When the percentage of carbon, manganese, phosphorus, silicon, sulphur, etc., has been determined, that will give the tensile strength, elongation and general physical properties necessary for the material best adapted to the requirements of service, a tabulated report is sent to the purchasing agent for distribution among the manufacturers for criticism from the producer's standpoint, and from their report the specification may be modified to insure a working shape. The specifications for steel and iron used for other purposes are evolved in a similar manner. . . .

With lubricating oils and greases, the question involved is largely efficient service at minimum cost. In a suitable machine, tests are made to determine the coefficient of friction with different lubricants at varying speeds, temperatures and pressures, and at the same time the wear of both axle and bearing metal per unit of revolution; these tests, together with the practical tests in service, give a means of determining the value of a lubricant. The petroleum industry is producing such an endless variety of oils, with such different properties, that the field for the expensive fat oil is growing more and more limited, and the chemist is constantly attempting to substitute mineral oils for the latter with safety and economy. . . . It will not be out of place to mention the influence of detergents on painted or varnished surfaces; nearly all the soaps on the market contain, besides the alkali combined with the fat,—viz, the soap—varying amounts of free alkali in the form of caustic soda and carbonate of soda, and those two act very energetically on the oils and gums in the paint or varnish. Indeed, if the percentage of the free alkali is considerable, it often will be necessary to send the car to the paint shop after a single washing. Enforcing the requirements for neutral soap will reduce this trouble to a minimum.

At the same time, an analysis of the soap will enable the company to pay actually for the amount it buys. When the soap is first made it contains considerable water, and is technically termed "green," and a pound bar of such soap will actually contain far less than a pound of dehydrated soap. If a bar is taken from a shipment at random, weighed and the percentage of alkali, or soap, determined, it is simple to calculate the amount of soap in the shipment, and pay for that amount. . . .

It is scarcely necessary to enumerate more instances in the long list of supplies needed on a railroad. From the few examples cited it can be seen how the same system may be extended to embrace other cases.

In the sharp competition and low prices of to-day there is a constant tendency on the part of the manufacturer to work to the lower limits of the specifications and even fall below the requirements, so it is quite necessary to examine the shipments day by day, and it is surprising to see how soon the manufacturer notes this fact and acts accordingly.

The experimental work and investigation includes the examination of many worthless nostrums, and also some valuable products where often a chemical analysis will determine the merits of the case without the expensive trial of a service test. Then, too, a substance is submitted for trial which no doubt justifies the claims made, but the cost of the ingredients and of manufacture are out of all proportion to the price charged, or an old rogue is disguised with a new name and complexion, and cast loose upon an unsuspecting public; in either case an examination will detect the fraud. . . .

* By Samuel Stockton Voorhees, of the Pennsylvania Railroad, Altoona, Pa. Read at the regular monthly meeting of the Engineers' Society of Western New York, Buffalo, N. Y., May 6, 1895, and published in the Journal of the Association of Engineering Society, June, 1839.

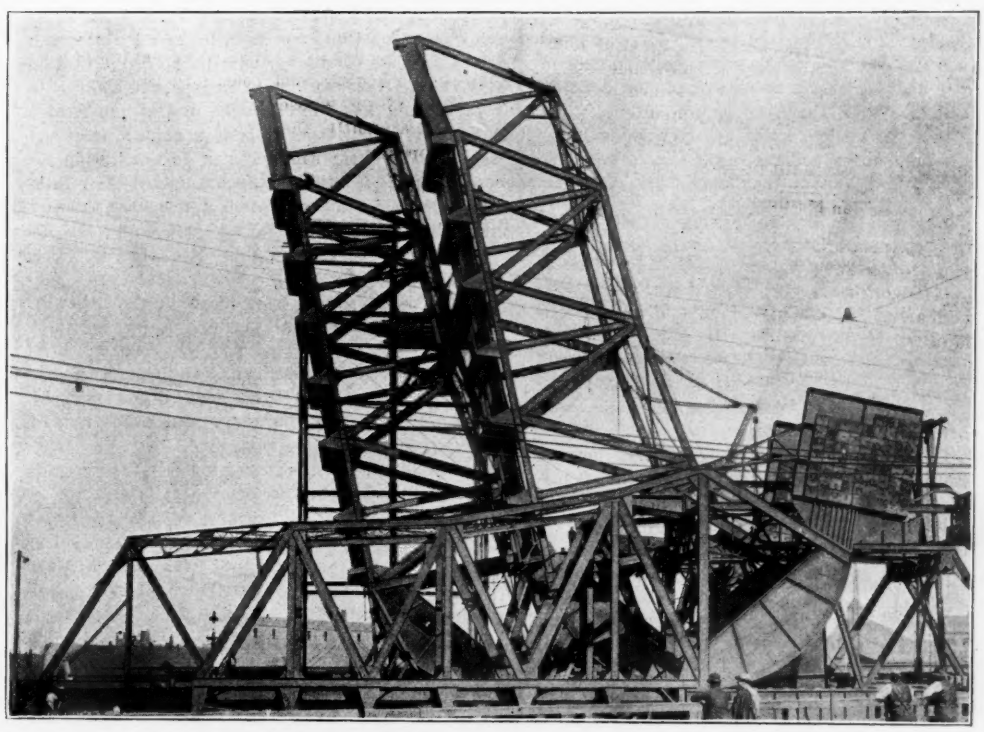

Fig. 2.—Scherzer Lift Bridge near New South Station, Boston—New York, New Haven & Hartford.

Heat Accumulators for Locomotive Boilers.

In a recent meeting of the St. Petersburg Society of Civil Engineers, Monsieur V. Wigoura presented a note on a heat accumulator for locomotive boilers. The apparatus described consists of a cylindrical reservoir of cast iron with a capacity of about 1,500 litres placed horizontally on the top of the boiler and communicating with it by pipes and valves, so that a part of the water of the boiler can be turned at will into the reservoir, or may be turned from the reservoir back into the boiler. The design is to permit feeding the boiler without lowering the steam pressure; the boiler is then fed by the hot water stored in the reservoir during stops or in running down grades, when little or no steam is consumed.

The application of these accumulators on the Moscow-Koursk Line of the Russian State Railroads, according to official reports, has given excellent results. The weight of the trains has been increased from 15 to 20%, while the reduction in the consumption of fuel has reached as high as 15%. The economical use of this apparatus pre-supposes conditions which are not always met, including long stops at stations and a variable work (—but not too much so—) that is to say, a profile consisting of inclines of moderate length. With a very favorable line, the accumulator would be of no importance; while if the profile consisted of very long inclines, its effect would not be sufficient. It is, then, a device which can be applied only in particular cases.

The efficiency of this apparatus being admitted under these conditions, the question may be asked whether such an addition to the boiler is necessary, and whether the same result may not be obtained in a more simple way by increasing the heating surface of the boiler, or even by increasing the volume of water. Monsieur Wigoura has examined these propositions and demonstrated that, besides the question of utilizing the existing material and its improvement by a quite insignificant addition, there are other reasons which give to the use of the heat accumulator in the conditions which have been indicated, a real advantage over the employment of a more powerful boiler. This latter would be more expensive in the first cost and in maintenance, and its operation would be more difficult in the variations of the quality of the combustible and the difference in vaporization which would be caused by the variation of the work.

The report considers this advantage of the accumulator as very important, because it has an influence on the life of the boiler. When we employ a boiler with a larger volume of water without increase of the heating surface, as Monsieur Wigoura observes, this can only be accomplished by increasing the diameter of the boiler, which gives a greater weight of metal and increases considerably the diameter of the shell, without at the same time increasing the thickness. The author has shown that in a boiler thus constructed, some parts of the water are insufficiently heated by the heat from the tubes, and that these constitute in reality an unproductive portion on account of the ineffectual transmission of heat in masses of still water. We cannot therefore think of increasing the volume of water in a given boiler by simply raising the water level; even admitting that there is a sufficient increment of volume, there would exist very serious entrainments of water in the steam because of the reduction of steam space, and also be a reduction of surface of emission of the steam from the water of the boiler. The author, without wishing to say that the form employed by the Moscow-Koursk Railroad is perfect or final, and that nothing will need to be changed, does feel justified in a conclusion that the employment of an independent accumulator of this kind for locomotive service has advantages which recommend it to official attention.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others can materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

During July we have noted in our news columns orders for 5,550 cars. Of these orders 3,905 were for box, stock, furniture and refrigerator cars; 712 were coal cars, 735 were flat cars, 140 were steel cars and 58 were for passenger service. Orders for 120 locomotives were also noted, the division of classes being approximately, 19 passenger engines, 92 freight engines and 9 switching engines. Of the 120 locomotives, 20 were ordered for export, of which 7 are to be electric mining locomotives for Japan, which we believe is the largest single order yet placed for these engines by a foreign country. It may be noted that the number of locomotives ordered has been remarkable even during the last three months, the average number ordered being 120 a month. The car orders shown an increase of nearly 500 over the June orders, which in turn were larger by 200 than those for May. It is believed that if as good crops are assured as are now indicated, a large number of cars will be ordered by the railroads or built in their own shops in the near future, although the present high prices are undoubtedly holding many orders in abeyance. Of the 5,550 cars ordered in July, 3,160 will be built in the shops of the railroads.

American Methods and Foreign Trade.

In speaking lately of American bridge building we mentioned the prevalence here of the system of working to standards. This has long been a remarkable characteristic of our engineering and manufacturing methods. It has become familiar to the world in our watches, small arms, sewing machines and agricultural implements. It has enabled us to invade Great Britain and the markets of the Continent with bicycles and tools for making bicycles. It accounts for a good deal of our success in selling electrical apparatus abroad.

It must not be supposed that standardizing in bridge building means duplication of parts, as in making watches or small arms. Two bridges are almost never exactly alike, and eye-bars and chords and posts cannot be made and stocked and merely assembled when an order comes in. But the standard designs must be adapted to the particular case in hand. In other words, standardizing in bridge building is rather of systems and methods and of the primary material than of actual bridge parts. There is still another reason why bridge parts cannot be made in duplicate and kept in stock. Besides the varying physical conditions, the commercial conditions vary. The designer must keep these in mind if he would get the most bridge for a dollar. At one time it may be cheaper to build up the members of plates and angles; at another time it may be cheaper to use rolled beams and channels. Furthermore, to get the greatest economy, the designer must know something about the machine equipment and methods of the shop which is to build his bridge, so that he can detail his structure with regard to the tools that build and handle it. This, if we can take the word of some recent writers in the British press, is part of what the British engineer does not know and do.

We need not multiply instances to support a conceded fact; but how has this fact come about? How did this young nation, prodigal and wasteful in many things, often impatient of careful training, go so quickly to the front in the mechanic arts and lead the world in the methods which most surely bring economy and efficiency of production?

Let us not encourage our most conspicuous national fault of ignorant self-conceit by saying that this has come about because we are Americans and therefore "smarter" than the rest of the world. Only a few years ago most of us were English, Scotch and Irish, and a good many of us were still more recently Germans, and we should not ignore our recruits from the Scandinavian countries. It is a little rash to assume that a few generations of exposure to United States soil and air has given to the inhabitants of the United States intellectual and moral qualities superior to those of the people from whom they are so closely descended. We shall not undertake to go further into this complicated general question, but we would suggest two or three possible reasons which have worked to develop in this country an economical system of building bridges, and of turning out a good many other engineering and manufacturing products.

Interest has been high and we have been driven to get the maximum product from the money invested in manufacturing plant; and also to get the money invested in large works under construction to earning income as quickly as possible.

Wages have been high and we have been driven to minimize so far as possible the amount of handwork and the number of men employed.

Back of all this may be constantly working the influence of the fact that, living in a country of great natural resources, with vast areas of unoccupied land available, and with the greatest freedom of the individual, we have been able to get quicker and larger results than any other civilized people. Hence we have perhaps become naturally somewhat impatient.

The opportunity of the workman is a factor not to be lost sight of. A skillful mechanic apprenticed in an English or Swedish shop filled with Carlyle's "mists of prejudice" becomes a better workman when transferred to a moral atmosphere where suggestion is acceptable and where he is free to work his head as well as his hands.

Another possible reason for our success, especially in works of civil and mechanical engineering, was suggested some months ago by a writer in Engineering (London), who pointed out that in recent times the conduct of engineering works in Great Britain has been largely in the hands of a generation whose fathers had acquired fortunes. Consequently, these younger men do not live in the shop and in the draughting room as did their fathers; whereas in America such enterprises are conducted largely by the men who are doing the designing and who are actually in charge of work. Hence, in one country new needs and new possibilities are sooner seen than in the other by the men who control things, and changes are more quickly brought about and improvements more easily made. In this theory of the writer in Engineering there may be considerable truth, and doubtless there are still other reasons which we have not yet suggested.

As an instance of the importance of the presence in the shops of men who know details and are interested as owners in the results we may mention a large printing press factory recently examined in Germany. It was well equipped with modern American machine tools. The output per man employed, however, was only about 60 to 70 per cent. of American practice. An American superintendent bred in our methods would change the result in that factory in a month, for it has a modern equipment; but usually the better way to rejuvenate an archaic factory, even here, is to first raze it to the ground and start in with a clean sheet of paper and "a clear open sight."

Finally, we may suggest a commercial reason for our present standing which is of great importance. This is the distinctly American practice of sub-contracting and piece-work; and directly connected thereto the methods of detail account-keeping of product per man or operation or machine, to the most minute detail. No doubt we have developed these systems further than has been the practice abroad. Probably this resulted directly from the interchangeable and piece-work system.

But the main thing is that we must not permit ourselves to think that our present position is the result of any special gift of the gods or that we shall have an easy path in competing with the engineers and manfacturers of the British Islands. No race has ever produced men keener, more tenacious and more energetic than the British; no race has produced finer mechanical and civil engineers. When we are tempted to assume that we shall find light work in any competition with John Bull it will be well enough to stop and think of certain words of Carlyle: "His epic is written in huge characters on the face of this planet; sea-moles, cotton-trades, railways, fleets and cities, Indian Empires, Americas, New Hollands; legible throughout the solar system."

Annual Reports.

Chicago & Northwestern.—The annual report of the Chicago & Northwestern Railway Co. for the fortieth fiscal year appeared this week, for the year ending May 31, 1899. The average miles worked during the year were 5,076.89, being an increase of 6.11 miles. The equipment was 1,010 locomotives and 38,076 cars of all classes.

In the year the company earned in gross a little over $38,000,000, the increase for the year being $1,965,753. The working expenses were $23,658,000, or $1,014,000 more than in the preceding year. In the cost of working appears a new item this year, namely, $58,472 for revenue tax stamps. After the payment of interest and other fixed charges, and adding a little over half a million of income from investments, there was available a net sum of $7,158,596. From this dividends were paid amounting to $3,523,270 (7 per cent. on the preferred and 5 per cent. on the common), leaving a net income over all charges of $3,635,326. The net gain in surplus for the year was $1,400,000.

These 1899 figures compare with a year in which large gains were also recorded, those in 1898 having been $5,073,318 in gross and $944,380 in net. Because of decreased interest charges, through the progress of the bond refunding undertaken last year and increased dividends from the Omaha railroad stock holdings and other securities owned, the balance available for dividends was over one million dollars higher than a year ago. After deducting the preferred stock dividend, the balance shown in the company's report, as available for common stock dividends, is equal to over 14 per cent. on those shares.

The increase in passenger earnings amounted to 11.18 per cent. The passenger-miles increased 15.48 per cent. and aggregated 416,384,000. The average fare per passenger per mile fell from 2.01 cents to 1.94 cents, but the average distance increased somewhat, as did the passenger-miles. The gain in passenger traffic is attributed in the main to the general increase in the business of the country, but this was supplemented by traffic arising from the Trans-Missouri fair at Omaha and slightly by the movement of troops.

The freight earnings increased 4.14 per cent. and amounted to $28,155,677. The ton-miles increased 6.56 per cent., aggregating over 3,229,000,000. The ton-mile rate fell from .89 of a cent to .87. With the increased ton-miles there was a decrease of freight train miles, the average train load having been 208.5 tons as compared with 193.8 tons the year before. The movement of loaded freight cars gained 3.88 per cent. and that of empty freight cars decreased 6.62 per cent.

In maintenance of way there was a decrease of $214,000, and in maintenance of equipment an increase of $826,000. The total charge to maintenance of way, structures and equipment, being 41.4 per cent. of the total operating expenses, increased 6.66 per cent. over the preceding year. Nearly 29,000 tons of new steel was laid and 20,000 tons of usable relay rails were put down. The net charge for rails amounted to over $311,000 and the total charges to maintenance of way and structures were about 4¾ millions. In maintenance of equipment there is an item of $769,000 charged to operating expenses for new locomotives bought to replace others, and an item of $1,398,000 for new freight cars. In addition to the new locomotives and cars charged to operating expenses 1,500 freight cars of various sorts were bought and five passenger cars, besides which four mail cars and three horse cars were built at the company's shops and charged to construction.

Much improvement work was carried out on the Northwestern lines, as in each year for some time past, and charged against the year's earnings. In 1899, the expenditures for maintenance of way equalled $932 per mile and the expenses for equipment show that repairs of freight cars cost an average of $59 per car; of passenger cars an average of $646 per car and for locomotives the average is $1,760 per engine. It would be hard, probably impossible, to fix on a fair average figure for cost per mile or per engine or per car for maintenance; but it is a safe general statement that the expenditure of the Northwestern, for these items, out of earnings, has been very liberal.

Of all the freight cars in service 74.81 per cent. are now equipped with air brakes and 99.75 per cent. with automatic couplers. It will be seen that

the road is in a forward condition as regards brakes and couplers.

The construction expenditures of the year amounted to almost $4,000,000. Of this $1,258,000 was spent on new second main line track and the company now has in operation 625 miles of double track railroad which embraces a considerable part of its three principal main lines diverging from Chicago toward the north, northwest and west. The expenditures on track elevation in Chicago amounted to nearly $1,000,000 and on new track laid as sidings $346,000, for almost 62 miles.

The stock and bond capital is practically unchanged, although during the year bonds to the amount of $2,964,000 were retired, being replaced by an equal amount of the new 3½ per cent. general mortgage refunding issue. In addition $1,000,000 of these bonds were paid over to the company by the trustee, for improvement work completed, but they are held in the treasury unsold. The income account shows that $5,000,000 was written off the surplus for construction work, new equipment and additions to the property, authorized in past years, and paid for out of accumulated income. This left the balance at the credit of income account, on June 1, 1899, as $4,686,479 as against $6,051,153 a year ago.

Foreign Trade of the United States for Three Years.

The nation's foreign trade, including both exports and imports, for the fiscal year ended June 30, 1899, according to the Government Treasury report just issued, shows an increase of some $77,000,000 over that of the phenomenal year preceding. The total exports of all products, domestic and foreign, this year, reached a total of $1,227,000,000, against $1,231,000,000 a year ago—a slight loss. But the total imports for the past year were $697,000,000, against $616,000,000 the preceding year. This gives a total balance of trade in our favor of $530,000,000 in 1899, against $615,000,000 in 1899. The principal increases in imports have been in articles of food, and to some extent in the manufactured products.

When we come to domestic exports, however, the differences between the two years are very small. In on field only, and that agriculture, are the exports less than for the preceding year. Of agricultural products, we sent out this year $785,000,000, against $854,000,000 last year, a loss of about $69,000,000. In exports of manufactures there has been a marked gain, the total for this year being $338,000,000, against $290,000,000 last year, or a gain of some $48,000,000. Of mining products we have sent out nearly $29,000,000, against $19,000,000 last year, a gain of nearly $10,000,000. Of forest products, we have exported $42,000,000, against $38,000,000 the preceding year, and from fisheries, $6,000,000, against $5,500,000 in 1898. Our total exports of domestic products during this yast year were $1,204,000,000, or only $6,000,000 short of the high water record of the year before.

Coming to individual items, we find, as might be expected, a marked gain in the exports of iron and steel and their manufactures. In the fiscal year 1899 we sent out no less than $93,000,000 of these products, against $70,000,000 in 1898, and $57,000,000 in 1897. The value of steel rails exported in 1899 was $5,300,000, against $4,600,000 in 1898, and $2,500,000 in 1897. This year we sent out 519 locomotives of a total value of $4,700,000, as compared with the 468 locomotives of 1898, valued at $3,900,000, and the 338 of 1897, valued at $3,200,000. Passenger and freight cars for steam railroads, we sent out this year to the value of $1,550,000, against $1,480,000 in 1898, and cars for other roads, $500,000, against $260,000 in 1898.

Pig iron exports reached 299,000 tons, at a total value of $3,300,000 in 1899, against 228,500 tons, valued at $2,400,000 in 1898, and 169,000 tons valued at $2,300,000 in 1897. Of steel sheets and plates, we sent out this year over 112,000,000 lbs., valued at $1,600,000, against 27,000,000 lbs. in 1898, valued at $335,000, and 5,600,000 lbs. in 1897, valued at $119,000. Structural iron and steel we sent out to the value of $1,760,000, against $1,180,000 in 1898, and steel wire to the value of $3,900,000, against $2,600,000 in 1898, and $2,240,000 in 1897.

As already noted, exports of agricultural products fell off severely this year. In breadstuffs we sent out $274,000,000, against $334,000,000 in 1898. In provisions of all kinds we made a gain, however, exporting $175,500,000, against $167,400,000 in 1898. Our total export lumber manufactures reached $41,700,000, against $37,500,000 in 1898; mineral oils $50,000,000 in 1899, against $51,000,000 in 1898; leather manufactures $23,500,000, against $21,000,000 in 1898; cotton manufactures, $23,500,000, against $17,000,000 in 1898; copper manufactures $36,000,000, against $32,200,000 in 1898; coal and coke $13,600,000, against $11,600,000 in 1898, and tobacco manufactures, $30,500,000, against $27,000,000 in 1898.

Of the total $697,000,000 of goods imported last year, $354,000,000, or nearly 51 per cent., came from Europe, including Great Britain; $112,000,000, or 16 per cent., from other parts of North America; $86,000,000, or 12½ per cent., from South America; $107,000,000, or 15 per cent., from Asia; $27,000,000, or 4 per cent., from Oceanica, and $10,500,000, or 1½ per cent., from Africa. Of the total, $1,237,000,000 of exports, this country sent to Europe $937,000,000, or 76 per cent.; to other parts of North America, $158,000,000, or 13 per cent.; to South America, $35,600,000, or 3 per cent.; to Asia, $48,000,000, or 4 per cent.; to Oceanica, $30,000,000, or 2½ per cent., and to Africa, $18,600,000, or 1½ per cent. of our total exports.

Strikes.

The principal strike news of the past week comes from Cleveland, where the trouble now is not on account of a strike, strictly speaking, but on account of the boycott which has been put in force by the defeated strikers. The employees of the street railroads in that city, who caused a serious interruption of traffic several weeks ago, began a second strike about July 17, the pretext being that the company had not fulfilled the agreement made in settling the first strike. The strike of July 17 did not cause a very serious stoppage of business, but a great deal of violence was at once stirred up and many companies of militia had to be called out. A street car was blown up by dynamite and 18 passengers were badly injured, four of them fatally. A new conductor shot and killed a boy who annoyed him. Seeing that the company was to get the better of them, the strikers last week began a most outrageous boycott, throughout the southern part of the city. Persons who rode in street cars were "spotted," and soon found themselves unable to buy the necessaries of life at stores. On the other hand, merchants who had anything to do with the street railroad company found that no one dared to buy of them. The militia are still on guard, and the reports in the daily papers would seem to indicate that the situation is so strained that justice and fair dealing will only be restored by suits at law to compel tradesmen to cease discrimination in the sale of goods. Suits of this nature have already been begun.

The principal strike news in the region of New York is the action of the freight handlers of the Pennsylvania road in Jersey City, who decided not to strike, though they were persistently urged by strikers on the east side of the North River. General Superintendent Sheppard granted the request of the men to be relieved of Sunday work during the summer, and made concessions in other directions. A Roman Catholic priest is credited with having done much to influence the Pennsylvania men to pursue a conservative course, and for his independent stand the partisans of the strikers in New York City threatened to get the Bishop to discipline the priest.

As a matter of record we append a note on the situation at New York which was inadvertently omitted from our last issue.

The strike of street railroad men in Brooklyn came to an end July 18, but just as it died out the labor leaders succeeded in starting a strike on the Second Avenue line of the Metropolitan Company in Manhattan. This was a small affair as regards interference with traffic, as cars were run with considerable regularity throughout, except for one night; but the disturbance afforded a pretext for a good deal of rioting in the streets (Second Avenue), and but for the very efficient work of the police there would have been much violence.

Freight handlers on the New York wharves of the Pennsylvania, the Lehigh Valley, the New York, New Haven & Hartford and other railroads, have been striking or attempting to strike for two weeks. New men were, however, secured without much trouble, and there appears to have been no absolute stoppage of traffic though many car loads of perishable freight have been nearly or quite spoiled and the New Haven road is said to have refused New York freight for a week. The New York City health officers condemned many carloads of fruit, and it is said that eight carloads of watermelons were given away at Jersey City on one day. Officers of the Pennsylvania road say, however, that the non-delivery of watermelons was due to an overstocked market and not to labor disturbances. The Central Vermont (steamboat line) acceded to the demands of its freight handlers for increased pay at both New York and New London. It was reported on July 24, that the New Haven road would grant the desired increase at New York: from 17½ cents an hour to 20 cents, with 25 cents for nights and Sundays. The Pennsylvania brought large forces to New York from Trenton. There was a considerable strike of freight handlers at Fall River.

It is announced in Philadelphia that the Pennsylvania Railroad has decided to create a pension and superannuation fund for the benefit of the employees of the company. It is understood that 70 years has been fixed as the age for compulsory retirement, and that employees who have been thirty years in the service, but who have not attained that age, will be entitled to the benefits of the fund on recommendation of the committee which will have the administration of its affairs. The pension allowance will be based on length of service, and the average wages received by the employees during such service. It is estimated that it will require the payment by the company of about $300,000 yearly to make the fund effective. The preliminary arrangements are now being made, so that at the meeting in the fall definite action may be taken by the Board of Directors and the fund be put into operation. The new arrangement will not interfere in any way with the Employees' Relief Fund, but will work in harmony therewith. No further particulars are given. The foundation for a fund of this sort was begun in connection with the (Sick and Accident) Relief Department of the road as long ago as 1888, when $170,788 was set aside and invested. This fund now amounts to $635,970, which sum is earning interest at 4 per cent. This, like the rest of the money in the custody of the Relief Department, has come chiefly from the contributions of the employees themselves, though the contributions to the Relief Department from the treasury of the company are not inconsiderable. The sum named in the above mentioned announcement, $300,000, is, presumably, the estimate of what will be needed beside the interest on what has already been accumulated. This is, we believe, the first move toward a general and adequate railroad pension fund that has been made in this country. The Baltimore & Ohio has a "Pension Feature" in its Relief Department, but we do not understand that its application is general or systematic. In the last annual report which is available, we find that under this "Feature" $34,800 was paid out during the year. The number of pensioners was 218.

The reader will notice that the regular monthly statement of eastbound shipments from Chicago, which is given in our traffic column this week, shows a remarkable total. This exhibit of a very heavy movement of grain from the West and the highly encouraging statements of earnings which have recently been published, and with which our readers are familiar, reflect a condition which has now become general. During the month of July the farmers rushed their wheat to the market at a rate seldom if ever before equalled at this season of the year. The receipts of wheat at the principal primary markets of the West for the month of June aggregated 20 million bushels, which was four times the quantity received in June, 1898. The movement in corn is also very heavy. A considerable scarcity of freight cars is now reported at Chicago, and some places east of there; at St. Louis, and at St. Paul. An officer of the Burlington road told a reporter that the company could use 5,000 to 10,000 more box cars than it has; and an officer of the Michigan Central said that his company was 2,000 cars behind its orders, while at the same time the soliciting agents were declining considerable freight. In general, however, the officers of the principal roads seem to have good understandings with shippers, and the prevailing condition is not usually referred to as a "famine"; the necessity of holding back a part of the enormous quantity of grain waiting to be moved appears to be generally recognized. The railroads have secured large quantities of grain which ordinarily would have gone by lake, for the reason that the lake vessels can now get high rates for carrying iron ore and coal. It is said that large quantities of anthracite coal which ordinarily would go by water have been taken West by rail. Large quantities of grain for export are now being received at Galveston.

The northern states west of the Mississippi River seem to be suffering from a veritable dearth of laborers. We have recently noted the decided advance in the rate of wages offered by railroad contractors and the lack of results from this action. A press despatch from St. Paul July 31 says:

In the Red River Valley the situation amounts almost to a crisis and the Northern Pacific and Great Northern officials are trying to devise some way to induce laborers to go to the relief of the farmers along this valley. The manager of Fairfield Farm at Wahpeton, needing one hundred men could get only twenty. The Northern Pacific, Great Northern and other roads have had a difficult time to get help for their construction work which they have been carrying on since early spring. An officer of the Great Northern says: "Since early spring men that we have shipped West to work on our line have nearly all thrown up their jobs. I do not believe more than ten per cent. of the men we have carried West have gone to work when they got there. They have gone into the mines or disappeared in other directions." Proprietors of employment agencies have a few inquiries, but the applicants seldom return after making inquiry. There are very few idle men. Those who are idle have money. In the spring hundreds of men engaged employment with the railroads just to get a free ride West. They are still in the West.

An amusing incident in connection with the reports of scarcity of farm laborers is the statement that an ordinary police law has aggravated the scarcity. "The law of North Dakota," says the reporter, "which prohibits men from stealing a ride on trains is seriously inconveniencing the farmers, who have heretofore depended upon transient labor for harvesting. The knowledge that this law is in force keeps harvest hands away from that state." And to think that this oppressive statute, trifling with the liberties of hundreds of American freemen, was passed by a Populist legislature!

Proposed Sea Wall in Chicago.

The sea wall along the Lake Shore Drive, Chicago, north of Oak street, was undermined and badly damaged for about 4,000 ft. by storms last fall and two plans for a new protection have recently been proposed. One is to rebuild the present breakwater, and the other to construct an entirely new sea wall some 100 ft. out in the Lake, filling in the intervening space for park purposes; the latter plan has been estimated to cost about $600,000, and is expected to bring out opposition on the part of property owners.

A local paper publishes a plan for rebuilding the present breakwater proposed by Mr. W. T. Casgrain, who for a number of years was connected

with the Engineering Department U. S. A., and at one time was Commissioner of Public Works at Milwaukee. The cost is estimated by Mr. Casgrain at $30 per lineal foot or about $120,000 for the whole wall. The plan provides for using the present superstructure, which consists of molded concrete blocks weiging about 20,000 lbs. each, replacing the timber foundations which have decayed, and filling in between the two rows of piling with concrete. An outside protection below low water level would then be built by driving a row of 30 ft. piles, 14 ft. 6 in. outside the sea wall foundation piles, in front of which would be placed triple lap sheeting. The space between the protection and the sea wall would then be filled with broken stone ballast and paved with stone blocks laid in cement, while cross bulk heads would be built every 100 ft. and large rip rap stones placed outside the protection.

The Lincoln Park Commissioners are now considering plans for protecting the shore line at this point.

TECHNICAL.

Manufacturing and Business.

The Indianapolis Street Railway has ordered 100 Dupont trucks from the Lorain Steel Co.

The New York office of the Chicago Pneumatic Tool Co. reports sales during the past week of 13 hammers and drills to the New York Navy Yard, including one of its shell riveters for bottom riveting, and 18 pneumatic tools for the Chinese Eastern Railway, the latter order including a Hall duplex compressor furnished by the Pneumatic Supply & Equipment Co., with receiver, hose, etc., to complete the installation.

The Consul of the United States at Bergen, Norway, writes that bids for supplies for the State Railroads should be addressed to Styrelson för Statsbanernas Drift og Anlaeg, Christiania.

A heating and lighting plant to cost about $35,000 will be installed at Vanderbilt University, Nashville, Tenn., this summer. Prof. C. S. Brown of the Mechanical Department is now arranging for the purchase of the apparatus.

The Gold Car Heating Co. and the Gold Street Car Heating Co., of New York City, report that the number of orders received by them during the past few months surpasses all the former records of the companies. Among the orders for electric heaters taken recently is one from the Boston Elevated for 100 new cars.

The Chicago, Milwaukee & St. Paul will use Chicago grain doors on the 500 cars which it is about to build at its West Milwaukee shops.

Valentine & Co. have recently bought the property at the corner of Ewen street and Skillman avenue directly adjoining their Brooklyn works, and have filed with the building department plans for a large two-story building. With this addition, which has become necessary because of the increased demand for varnishes consequent upon the improved condition of the carriage industry, the building will cover the entire block from Jackson street to Skillman avenue. It is reported that the company is maturing plans for starting up its Long Island City plant in order to have the requisite facilities for making and storing its Lawson varnishes for the eastern trade, the output at the Chicago factory proving insufficient to meet the increasing demand for that brand.

Pressed Steel Car Co.'s pressed steel bolsters have been specified for 500 coal cars for the Illinois Central, and for 200 refrigerator cars for Swift & Co., recently ordered.

G. D. Seppings, Manager of the London branch of Thornton N. Motley Co., has secured offices at No. 37 St. Mary Ave., and has entered actively into business at that address.

G. E. Macklin, until recently Special Agent for the Pressed Steel Car Company, has been made Assistant General Sales Agent, with headquarters in the Empire Building, 71 Broadway, New York City.

Government Work.

Bids are wanted by Aug. 12 for building a levee on the Red River, above the Harvey Canal, Caddo Parish, La. There will be about 300,000 cu. yds. Address Major J. H. Williard, Corps of Engineers, U. S. A., Vicksburg, Miss.

Bids are wanted until Aug. 26 for dredging in the Merrimac River. Address Colonel Chas. R. Suter, Corps of Engineers, U. S. A., Boston, Mass.

The War Department has ordered that plans and specifications be prepared for letting the contract to complete the Alameda Tidal Canal, Oakland, Cal.

The contract for building the San Luis Obispo breakwater was let July 21 to Captain A. A. Polamus of San Diego, Cal., who is required to give a bond of $20,000.

The proposed harbor improvements at Oakland, Cal., which are estimated to cost not less than $1,000,000, will give that city four miles of dock frontage on deep water.

Wakefield & Jacobson have the contract for building the Coos Bay jetties, Oregon, for the sum of $123,710. Hale & Smith have the Siuslaw contract at $23,737; and John Kiernan was awarded the work at the mouth of the Coquille, for $23,568.

The Copper Sheathed Passenger Car.

Our readers will remember the descriptions and other information concerning Mr. Appleyard's copper sheathed passenger cars which we have published from time to time in the last two or three years. In looking recently into the subject we find that there are now in service 23 cars sheathed with copper and that at least seven more are being sheathed for trial. So far as we are able to ascertain, the trials to date have been very satisfactory. Some of these extend over a period of two years and a half. Naturally, the experiment is likely to receive a check at the present price of copper. A 60-ft. coach takes about 1,000 lbs. of copper. The cost of the labor is trifling. With the machine now used all the sheathing for a car can be plated with metal in one day by a man and a boy. Obviously, the scrap metal, if copper is used, is nearly as valuable as the new metal, and giving proper credit for scrap the first cost is no more than that of a painted car. Indeed there are railroad officers who say that it costs less. The convenience and economy of maintenance appear to be great. A car so plated need not be held in the shop for any work beyond cleaning it and varnishing the interior or other minor inside work. Inasmuch as the exterior does not need to be painted and varnished the inside work of the car can be done in a yard and shop room saved.

Chicago Drainage Canal.

The Trustees of the Sanitary District took the members of the Democratic National Committee and visiting Congressmen for an inspection trip along the Drainage Canal on July 21 in a special train on the Atchison, Topeka & Santa Fé. Work on all unfinished parts of the canal is being pushed day and night except on section 18, on which night work has been delayed by the recent rains. At the Campbell Ave. railroad bridge on which McArthur Bros. have the contract, an electric light plant has been put in and a force of 200 men in three shifts of 8 hours each, is excavating. It is said that work on the bridge abutments will be begun within one month. Night shifts have also been put to work on the Western Indiana bridge and the Van Buren St. Bypass, and it is now believed that the canal can be completed and opened by Dec. 1. (July 21, p. 527.)

Montreal Harbor Improvement.

A bill is in the Dominion House of Commons which amends the act of last year, by which the Montreal Harbor Commissioners were empowered to borrow $2,000,000 in consideration that $750,000 be spent in the eastern portion of the harbor. The present act relieves the Commissioners of part of the obligation to spend $750,000 in the eastern portion, and permits them to spend only $250,000, provided $500,000 is spent at the Windmill Point. In order that the eastern portion shall not suffer, the government will spend $500,000 there, and will provide that amount in the supplementary estimates.

Automatic Block Signals on the New York Division.

The electro pneumatic block signals which have been in course of construction for several months on the New York Division of the Pennsylvania Railroad between Perth Amboy Junction and Monmouth Junction, are now finished, and they are to be put in operation on Sunday next. With the completion of this apparatus the New York Division, which is four-track except for a short distance in Newark and another short stretch in New Brunswick, will be equipped with automatic block signals the whole length of the main line, about 86 miles.

The American Switch Company.

The American Switch Company has been organized under the laws of New Jersey with a capital stock of $11,000,000, one-half six per cent. cumulative preferred and one-half common stock. The President is Mr. Alfred H. Mulliken, President of the Pettibone-Mulliken Co., of Chicago. The Directors will include owners of existing plants and prominent financial men. Mr. Anson R. Flower is one of the Directors and Messrs. Flower & Co. are managers of the underwriting syndicate. The purpose is to include in this one company various makers of frogs, switches, switchstands and allied equipment. Mr. Mulliken denies that this company has any relations with the Federal Steel Co., other than that some of those interested have interests in both companies. The companies included in this combination, so far as we can learn, are the Ramapo Iron Works, Cleveland Frog & Crossing Co., Ajax Forge Co., Carlisle Mfg. Co., Paige Iron Works, Pettibone-Mulliken & Co., Weir Frog Co., Morden Frog & Crossing Works, Johnson Frog & Crossing Co., Elliott Frog & Switch Co., and the New York Frog & Crossing Co. It will be observed that the combination has swept the field pretty thoroughly, so far as the big concerns go, although the Pennsylvania Steel Co. (Frog and Switch Department) seems to be out.

The Crewe Works of the North Western, England.

Mr. James Vose, of Manchester, England, gives in the American Machinist of July 13 some particulars about the Crewe Works at Crewe, 160 miles northwest of London on the London & Northwestern Railway. At present, about $2,500,000 are being spent by the company on improvements connected with the main line and its branches in the district and not only operates the works at Crewe but also much of the manufacturing plants of the town. About 150 new locomotives are turned out yearly at the works. Mild steel to the amount of 6,000 tons is produced yearly at Crewe by the Bessemer and Siemens-Martin processes for rail making, boiler plate and structural purposes. In the shops there was recently installed a 2,000-ton hydraulic press. Much of the riveting is done by hydraulic machinery. A number of pneumatic calking machines are also at work, and copper firebox staybolts are particularly well finished by these machines. Hydraulic machines are used in the flanging shop, working at 2,000 lbs. pressure. This shop turns out about 250 new locomotive boilers yearly in addition to the repairs on about 3,000 locomotives in service. Very little American machinery is used. Among others, however, is a Fay-Egan wood dovetailing machine. Electric welding is in use in several of the smith's shops and electrically-driven portable drills are quite common. Sound steel castings now replace extensive forgings.

The Isthmian Canal Commission.

Sixteen men recently sailed for Greytown to take up the work of surveys and boring on the Nicaragua Canal route. The remainder of the party, about 40, will sail August 5. The field work is in charge of Mr. J. Imbrie Miller, M. Am. Soc. C. E., who had charge of the South American party for the Intercontinental Railway Commission.

Westinghouse Electric in England.

The British Westinghouse Co. (Electric) has recently been organized with a capital stock of £1,500,000. The proposition is to make in England every description of electrical machinery. The company has secured land at Old Trafford, near Manchester, on the ship canal, and will at once put up buildings sufficient to accommodate 5,000 workmen. Naturally, this important event causes a great deal of comment and speculation in England. One of our English exchanges says that "even if the British Westinghouse Company were more foreign in character, one could hardly wish it otherwise than a permanent success," which seems to be a sufficiently guarded way of speaking of the matter. The applications of electricity to transportation in the British Islands have only just begun and the Westinghouse Company with their great skill and experience and with their many valuable patents will undoubtedly be able to take a large part of this business in competition with the English manufacturers as well as with the General Electric Company. In lighting the English are more advanced, and pretty nearly all the electric lighting work in the United Kingdom is done by British companies. There seems, however, to be room for economy by the introduction of larger units, multiphase currents and other American practice, and in rebuilding and re-equipping central stations for lighting the Westinghouse people will again have an opportunity. Certainly their courage and enterprise deserve success and will probably win it.

Bridges and Engines for England.

The latest "Engineering Trades Report" of Matheson & Grant, London, has the following interesting paragraphs:

Steel Bridges and Structures.—Makers are still fully occupied and are unable to promise early delivery for new work. American competition only prevails when freedom of design and method are given to the foreign manufacturer which is withheld here, and if this system is found advantageous the English makers are quite prepared to compete on equal conditions. The preference for solid riveted work as against the too frequent use of eye-bars is advancing in the United States, even where the legitimate advantages of pin connections are retained, and as each continent is taking what is best of the other, the differences between the two are gradually becoming less.

Locomotives and Rolling Stock.—Manufacturers here are so fully engaged as to be still unable to offer early delivery for any kind of engine or carriage, although this scarcity is more severe in heavy main-line stock than in the lighter kinds. The American Engines which have arrived and which are at the date of this report being put together, do not by their appearance, strengthen the likelihood of dangerous competition, while the advantages offered of low-price and prompt delivery can be met here if the same conditions of design and quality be allowed to British makers, a similarity of usage which has not hitherto prevailed. It may be said, however, that the narrower and lower loading gage available on English railways, permitted by the tunnels and bridges on British lines, does not afford scope for the more powerful types of American engines, although the rail gage is the same in both countries. There is at present a strong demand for tram-cars.

Motor Cars have not come into use to the extent which was expected when the statutory restrictions to their use on the public roads were relaxed a few years ago. Cabs and other light vehicles which, in France, are propelled by engines depending for their force on volatile oil like benzoline, are here generally worked by electric storage batteries, and do not seem to compete to advantage with the smarter French carriages. For motor cars carrying merchandize through City streets, steam engines, with oil or coke fuel, appear to be the best suited.

THE SCRAP HEAP.

Notes.

The Wisconsin Central Railway has been informed by the Secretary of State of Michigan that it must pay a franchise fee of $15,000 for having the articles of the new corporation recorded in Michigan, though only eight miles of the line of the road lies in that state.

The New Hampshire Railroad Commission has ordered that all electric passenger cars run in that state during December, January, February and March, shall be provided with vestibules, except where the cars make trips not exceeding fifteen minutes in schedule time.

James M. Garlington was hanged at Fort Worth, Tex., July 28, for train robbery. Garlington was the leader of a band who robbed a Santa Fé train near Fort Worth, July 21, 1898, and killed the engineman and fireman. One of the other robbers has been sentenced to the penitentiary for life.

The New York, New Haven & Hartford is putting telephones in its signal cabins between New York and New London. The newspaper reporters who have been trying for several weeks to make out that there is likely to be a strike among the telegraph operators of the New Haven road, assert that the telephones are being put in because the company fears a "tie-up" of its block signals.

A press despatch from St. Louis says that the Missouri Pacific has subscribed $85,000 toward the Louisiana Purchase World's Fair, which is to be held in that city. It is said that the Burlington has subscribed $55,000 and that other railroads will subscribe enough to make the total from the railroads $600,000; so that the promoters calculate that four-fifths of the five millions of stock which it is desired to raise is already assured.

A press dispatch from Easton says that the Lehigh Valley has announced for the New Jersey and the Lehigh divisions that enginemen will be paid $2.75 a day for the first six months, $3 for the second six months and $3.25 thereafter. Men out over 12 hours 35 minutes will be allowed over time at one-tenth of a day's pay for each hour. Any employee who is dissatisfied with the discipline administered may appeal to the Superintendent and to the General Superintendent.

Freight on Street Railroads.

At Detroit the Circuit Court on July 27 granted a permanent injunction restraining the street railroads from carrying freight over their lines within the city. The cars of the suburban lines have heretofore carried freight over the lines of the city roads without special authority for so doing. (July 21, page 527.)

The Baltimore & Ohio Receivership.

At the convention of the Maryland Bar Association at Ocean City, July 27, a paper was read by President John K. Cowen, of the Baltimore & Ohio, on "The Baltimore & Ohio Receivership." In summing up, Mr. Cowen said:

"1. Every bondholder of the Baltimore & Ohio Railroad has received new securities which substantially pay his full debt. In other words, the bondholders have been paid in full.

"2. The floating debt creditors have received every cent of their indebtedness.

"3. The first preferred stockholders have received in cash 75 per cent. of the par value of their stock, the court over-ruling their claim of preference over the bondholders and creditors. The second preferred stockholders have received securities which, after payment of this assessment, net about $70 per share, at the present market, and at times over $80 net could have been realized.

"4. The common stockholders, instead of being wiped out, have received their common stock in the new company, upon paying an assessment, the net amount of which (because of the value of the securities received for such assessment) would not exceed $5 or $6.

"5. The company saves its old charter for whatever value may attach to it.

"It is true that, although this paper deals with the judicial administration of a great trust, it does not present any fine hair-splitting legal questions, but it shows that in American jurisprudence there has been evolved a method whereby the courts can take a great property whose administration is full of difficulty and they can so rehabilitate it that substantial justice may be done to bondholders, floating debt creditors and stockholders, that this can be done without violating any of the well-defined rights of any creditor, and that it is the duty of the courts in administering these great trusts, to place the property in the position where its possible earning capacity can be shown, and a fair and just reorganization can be made.

"When the Court had done its work and put the property into the position where its fair earning capacity could be shown, it became evident that no one interest need be sacrificed, and then was brought into play that wonderful and delicate machinery of modern commerce, a part of what Mr. Bagehot calls the 'lending apparatus of the world,' whereby the distribution of more than $200,000,000 of securities was secured by great banking houses—Speyer Brothers, Speyer & Company and Kuhn, Loeb & Co. They placed their names on a reorganization agreement, and at once the 'loan and investment fund' and the 'speculative fund' of two continents was drawn on to make the plan a success."

Fast Run on the Lackawanna.

A Buffalo paper of July 10 reported that a special train carrying officers of the Delaware, Lackawanna & Western had, on the preceding day, made a run from Bath, N. Y., to East Buffalo, 104 miles, in 69 minutes, which would figure out an average of about 90 miles an hour for the whole distance. Presuming that there was some basis of truth for the statement we made inquiry, and we learn from an officer of the road who was on the train that there was, indeed, a nice little run on that day; but that it was nothing that they would think of bragging over. The traffic officers on the train merely requested the Division Superintendent to give them a good, fair, safe run. They were not at all particular in their requirements and in fact they did not spend much time looking out of the windows, anyway. The telegraph poles did not resemble a picket fence, and no one noticed that the wheels were rolling very fast. So far as was observed, the puffing (at the cigars in the café car) was not more rapid than usual. However, on arrival at Buffalo it was found that the 104 miles had been traversed in 90 minutes, or at the rate of 69.3 miles an hour. The speed was moderated at curves and through stations. As sixes and nines and ciphers look a good deal alike (or can be made to look so), and as "69," in the reporter's account, would have been all right if it had been given as the rate instead of the amount, it will be seen that the lie was only an "error."

Chinese Railroads.

The section of the Chinese Eastern Railroad (Manchuria) between Liuchateng and Haiching has been finished and the trial trip of a locomotive was made April 29. The line to Moukden will be finished by August and the line to Talien will be opened for traffic in October.

Work on the Imperial Railways of North China is proceeding and it is expected that the line between Shanhaiquan and Newchwang will be open for traffic in July or August of next year.

A despatch from Peking says that a number of British and German capitalists have agreed to float a loan of 50 million taels to build a railroad from Tientsin to Chinkiang.

Street Paving in Chicago.

The Board of Local Improvements of Chicago, of which Mr. L. E. McGann, Commissioner of Public Works, is President, has been trying to make all the new street pavements of better quality and more durable, and asphalt pavements have been laid on a number of important streets. The Board recently asked Mr. Henry I. Sheldon, of Sheldon & Sheldon, to make a report on the latest pavements laid in European cities, Mr. Sheldon having made personal investigations of the matter in the different cities. At a meeting of the Board Mr. Sheldon explained the plans now followed in Paris and London, full plans, drawings and specifications of which he has obtained and delivered to the Board. Some of the results of his investigation are as follows: In Paris paving with stone blocks, granite or other kinds, has been entirely given up and no more is laid. Asphalt is no longer laid in the section of the city which includes the boulevards, opera house, theatres, hotels and principal stores. It would not stand heavy traffic and was too slippery in wet and icy weather. Macadam is only laid in residence districts and there is carefully watched and the many miles of it are kept in repair. In the central district only high class stone and concrete pavements with a top layer of hardwood are laid. First large stones are laid and on these small stones; then broken stone, then a layer of concrete and, as a surface, a layer of rectangular blocks of some hard wood which has been first immersed in tar. Twelve different kinds of wood are now being used. Some is pine from the Baltic, some a hard pine from Cochin China, and some is hard pine from the Atlantic coast of France, and a new wood from South America is being tried for the points of greatest wear. The same pavement is now being laid in smaller cities in France. Mr. Sheldon urged that for central business districts and main thoroughfares Chicago should use modern wooden pavements, hardwood tops. For use in Chicago, Southern pine was favored as being the most available and economical to use at first. The head of the Chicago Street Paving Department is prepared to make specifications for this pavement, and it is said that if any property owners wish to try it and will pay the difference in cost it will be laid at once on any street or even on any block.

The Irish Channel Tunnel.

The project of a tunnel across the Irish Channel has been lately brought forward in England and has caused a good deal of talk on both sides of the Atlantic. The readers of the Railroad Gazette will probably remember that this is an aged scheme, that Sir Edwin Watkins some years ago had a project for a tunnel across the Irish Channel, another across the British Channel and either a tunnel or a car ferry across the Straits of Gibraltar, and thus a through line of rail communication from Cork to some point in Asia, possibly Herat. We forget the exact terminus. The promoters of this present scheme estimate that the cost of the Irish tunnel will be $50,000,000 and that the interest during construction will be 10 millions more, or a total of 60 millions. They wish to make sure of being able to pay three per cent. on this outlay and to that end ask the Government to guarantee any deficiency up to but not exceeding three per cent. Mr. Balfour in replying to a deputation said that he could not speak for the Government, but pointed out that the project is for a tunnel not from England to Ireland but from Scotland to Ireland and that in all probability passengers, mails and freight would continue to follow the more direct southerly routes which they now follow, and that the promoters might well doubt their ability to compete with water borne traffic. He suggested that it might be as well also to ascertain pretty carefully the nature of the ground to be traversed before embarking on a scheme so colossal.

Four Train Robbers in State's Prison.

After many lapses in the administration of justice by mistrials and verdicts of acquittal, the State of Missouri has nobly redeemed itself in the quick, successive conviction of each of the train robbers implicated in the hold-up of the Kansas City, Ft. Scott & Memphis train at Macomb, Mo., January 3 last. The convictions include the leaders of the Cracker-neck gang of desperadoes—notably Bill Jennings and Jack Kennedy, the former a remnant of the old James gang, and the latter of the more recent type of outlaws. "Local sentiment" seemed to make it impossible to secure any conviction, and it was only when the gang went outside of their sacred bailiwick —Cracker-neck district—which they did in the Macomb hold-up, that they felt the strong arm of the law upon them. Here is the list: William Jennings, twenty years' sentence; John F. Kennedy, seventeen years; Jacob Fagley, twelve years; Joseph Shepard, ten years. The press of Missouri is felicitating itself over the convicting of these criminals, and rightly, too; but the Southern Express Company must be accorded the greatest credit; for it has been largely through their relentless pursuit and vigorous prosecution of the bandits that they have been finally placed behind prison bars.—Express Gazette.

The Cape-to-Cairo Railroad.

We have had occasion several times lately to speak of the Cape-to-Cairo Railroad project and have repeatedly expressed the opinion that commercially it could never pay and that politically and strategically it is unnecessary; and that we do not believe that Mr. Rhodes himself has any present notion of building a continuous line of railroad the length of the Continent. We find in the August issue of McClure's Magazine an article on the subject by Mr. W. T. Stead. He begins by quoting the opinion of Mr. Rothstein of St. Petersburg, a man of information and influence, on the railroad across Siberia. Mr. Rothstein thinks that the sacrifices which the construction of that railroad calls for will never be repaid, that it is impossible to justify the road on financial, political or military grounds, that the sacrifices are much more obvious than the gain to Russia; but he thinks that the railroad is being built under the compulsion of an impulse or instinct which occasionally drives nations to do these things in obedience to the plans of an overruling power. Mr. Stead takes the same view of the Cape-to-Cairo railroad. He agrees with what we have said as to the probability that it will not earn working expenses, and as to the fact that it is not needed for strategic or political purposes. Yet he says "it is by no means impossible that the Cape-to-Cairo line may be in working order in 1909." He says it is by no means "impossible," but he brings forward no specific fact to make it seem probable. His article is interesting, contains a good deal of information evidently drawn from interviews with important people, and it contains a small, but relatively unimportant, amount of misinformation.

Proposed Express Service on the Lake Street Elevated, Chicago.

On account of the increased traffic on the Lake Street Elevated, due to the western extension through Oak Park and Austin, a plan for the establishment of an express service is being considered. The Lake Street structure is built to accommodate three tracks west of Rockwell Street, although at present but two tracks are laid. It is proposed to add the third track and use it during the morning and evening rush hours for express trains, but nothing definite has as yet been decided.

The Texas Flood.

The damage to the railroads of Texas by the flood of June 28-30 seems likely to aggregate more than half a million dollars. We have the following notes in addition to those published July 21, p. 521:

The San Antonio & Aransas Pass was blocked between Wallis and Fulshear, a distance of 12 miles, for eight days. Fifteen trestles, aggregating 3,915 ft. in length, were badly damaged, most of them having the stringers and decks washed off, but nearly all of the timber was recovered. The embankments were damaged considerably and the track was washed off the roadbed in some places. The work of replacing the track and bridges will cost about $40,000.

The Missouri, Kansas & Texas line was damaged mostly between Sealy and Brookshire, 13 miles, where traffic was suspended for one week. The track was submerged for about four miles and for about one mile the rails and sleepers were overturned and left in the ditch. Of the six trestle bridges in the submerged section, four suffered but little damage. The steel bridge over the Brazos River, 420 ft. long, was damaged by driftwood, and the cylindrical iron piers, 6 ft. in diameter, were forced down stream about 16 inches (measuring at the top) and were somewhat damaged. The damage to this bridge was estimated at $10,000 and to the other parts of the roadway about $25,000.

Cave-in of a Tunnel.

Press despatches from Cambridge, O., of July 27 say that a tunnel just west of that town, on the Baltimore & Ohio, has caved in, completely blocking the track. It appears that for some time small quantities of material have been falling and the tunnel has been carefully watched. This tunnel is about 700 ft. long and the press accounts say that about 150 ft. is blocked with the fallen material and that at least two weeks will be required to clear it. Meantime, trains are run over the tracks of the Cleveland & Marietta Railway.

LOCOMOTIVE BUILDING.

The Baldwin Locomotive Works are building 30 locomotives for the Philadelphia & Reading.

The Choctaw & Memphis has ordered seven more engines from the Baldwin Locomotive Works.

The Schenectady Locomotive Works have an order to build in all 80 engines for the Chicago & Northwestern.

The Brooks Locomotive Works have received an order from the Lake Shore & Michigan Southern for 25 engines in addition to the 11 recently noted.

The Central Railroad of Peru has placed with the Baldwin Locomotive Works a trial order for two locomotives, the builders to submit plans of the type considered best adapted for the service required by the road.

The 12 compound locomotives ordered some time ago by the Chicago, Milwaukee & St. Paul and now being built by the Baldwin Locomotive Works are for September delivery and will weigh 148,000 lbs., with 108,000 lbs. on the driving wheels, and have 13½ in. and 23 in. x 26 in. cylinders, 62 in. driving wheels, straight top boilers, with a working steam pressure of 200 lbs.; 262 two-in. tubes, 15 ft. long; fire boxes, 8 ft. 7 in. long and 3 ft. 6 in. wide, and a tender capacity for 3,800 gals. of water and eight tons of coal. The special equipments include Westinghouse-American brakes, Hein couplers, Ohio injectors, Leach sanding devices, Detroit lubricators, French springs, Crosby steam gages, Latrobe and Midvale tires, Latrobe chilled tender wheels and Worth Bros.' and Carbon boiler steel.

In our issue of July 21 was noted the order placed with the Pittsburgh Locomotive & Car Works for three eight-wheel passenger locomotives, one being for the Kansas City, Fort Scott & Memphis, and two for the associated company, the Kansas City, Memphis & Birmingham. These engines are to be alike, and delivered about the middle of September. The weight on the drivers will be 78,000 lbs., the

total weight 116,000 lbs., the cylinders 18 in. x 26 in. and the driving wheels 69 in. in diam. The boilers will be of the extended wagon top type to carry 180 lbs. steam pressure, and have 250 iron tubes, 2 in. in diam. and 12 ft. 2 in. long. The width of the Carbon steel fireboxes will be 40 in. and the length 96 in., and the tender will have a capacity for 4,000 gals. of water and seven tons of coal. The equipment specified includes the following: American-Westinghouse air-brakes, hammered iron axles, Taylor iron crank pins, cast steel driving wheel centers and Latrobe tires, McKee-Fuller truck wheels, chilled tender wheels, Golmar bell ringers, Janney couplers, Pyle-National electric headlights, Monitor injectors, Ashton safety valves, Leach sanders, Nathan lubricators, Ashcroft steam gages and Harroy blow-off cocks.

CAR BUILDING.

It is reported that the Chicago & Alton will buy 100 furniture cars.

The Pressed Steel Car Co. is building 250 cars for the Philadelphia & Reading.

The Rio Grande Western has asked for bids on 50 coal cars of 80,000 lbs. capacity.

We understand that the Michigan Central is considering ordering some freight cars.

The Consolidated Cambridge Coal Co., of Cleveland, O., is preparing specifications for 200 coal cars.

The Chicago & Northwestern has ordered from Pullman's Palace Car Co., 1,000 gondola and 250 flat cars.

It is reported that the Central of New Jersey will shortly order some freight cars. We have no official information.

The Mexican Central has asked bids on 100 box and 100 coal cars and it is possible that beside these some steel cars will be bought.

We are officially informed that the Illinois Central is completing an order for 700 coal cars at its own shops which have been previously noted, and that it has no more cars under consideration.

The 30 caboose cars which the Allison Mfg. Co. is building for the Mexican Central, as noted July 21, are to be four-wheeled way cars, for use on the Tamosopo Mountain, and are an innovation on this road.

The 500 box cars of 60,000-lbs. capacity ordered by the Louisville & Nashville from the American Car & Foundry Co., and noted in our last issue, will weigh 32,000 lbs., and will be 36 ft. 6⅝ in. long, and 8 ft. 9 in. wide over sills; the height to the eaves will be 12 ft. ¾ in. The specifications include the following special equipment: Sterlingworth brake beams, New York air brakes, Hein couplers, Wagner doors and door fastenings and Winslow roofs. The bolsters will be of wood, and the brasses, journal boxes, journal box lids and trucks will be the standards of the road.

The Atchison, Topeka & Santa Fé will complete at its Topeka shops about Sept. 1 the 250 80,000-lb. box cars for the San Francisco & San Joaquin Valley Ry. which were noted in our issues of Feb. 10 and 17. These cars are 39 ft. 4 in. long, 8 ft. 3 in. wide and 6 ft. 11 in. high, inside, and weigh 35,300 lbs. They are equipped with Westinghouse quick action brakes, Trojan couplers, Player brake beams, A., T. & S. F. standard trucks, with cast steel frames, and truck bolsters made by the Shickle, Harrison & Howard Iron Co.; Bettendorf body bolsters, Chicago-Cleveland metal roofs, American continuous draft rigging, Brown mineral paint, Fort Madison wheels, hammered iron axles and A., T. & S. F. standard brake shoes, brasses, doors, door fastenings and journal boxes and lids.

The Des Moines (Ia.) City Railroad has ordered 12 cars from the Laclede Car Co. They will measure 40 ft. long, have vestibules on one end and be fitted with smoking compartments.

BRIDGE BUILDING.

AMSTERDAM, N. Y.—The contract for building the overhead bridge across the New York Central tracks at St. Johnsville is awarded, reports state, to Dwyer & Huntington of Buffalo.

ASHLAND, NEB.—The town will be bonded in the sum of $6,000 for a new bridge below the B. & M. RR. bridge over the Platte River. It will have a span of 1,900 ft., but it is undecided what kind of structure will be built. Ira Sexton, City Clerk.

BATTLE CREEK, MICH.—The Bridge Committee, it is stated, reported to the Common Council that nearly all bridges in the city are in a bad condition and should be repaired or replaced.

BAY CITY, MICH.—The Michigan Central and Bay City Consolidated railroads propose to separate the grades in Washington St., West Bay City, which would involve some 800 ft. of earth approach and 160 ft. of bridge. The matter is not settled yet.

BOSTON, MASS.—State Treasurer Shaw will shortly receive proposals for an issue of $1,000,000 3% 40-year bonds for the abolition of grade crossings.

CAMBRIDGE, MD.—Proposals will be received until Aug. 15 at the County Commissioner's office in Cambridge, for the superstructure and the substructure of a pile bridge, with a steel railroad draw span, to be built over the northwest prong of the Nanticoke at Brookview. The steel span will be 112 ft. long, and the entire bridge about 300 ft. in length. J. Wilson Dail, President; James M. Robertson, Clerk to the County Commissioners. (July 21, p. 528.)

CHARLOTTESVILLE, VA.—Reports state that Albermarle County will build a steel bridge across the Ravinna River to cost $5,000.

CONSTANTINE, MICH.—A 72-ft. steel bridge, according to report, will be built across Fawn River to replace a wooden structure.

CHICAGO, ILL.—The Chicago & Alton will build an iron bridge to replace the trestle two miles east of Pearl. The company is building a good many plate girder bridges this year to replace trestles and trusses for heavier loads. The bridges over the Missouri River near Kansas City, Mo., will also be replaced at a cost of about $400,000, and contractors are asked for bids on three new pneumatic pier foundations for it. H. C. Draper, Chief Engineer.

CLINTON, IA.—The Davenport, Clinton & Eastern RR. will need a bridge across the Wapsiepinnecon River. Address Frank P. Blair, Vice-President, Davenport.

CLINTON, IND.—The Lafayette Bridge Co. has the contract for the 168-ft. steel bridge across the Wabash River at $29,300; also a $10,000 contract for repairing the old piers. (July 7, p. 496.)

COLUMBUS, S. C.—Reports state that the A. & P. Roberts Co. has the contract from the Seaboard Air Line for building two plate girder bridges, one across the Congaree River near Columbus, and the other to span the Wateree River near Camden. (June 23, p. 459.)

COPPOCK, IA.—The George E. King Bridge Co., of Des Moines, Ia., has the contract for the new bridge over the Skunk River, at $7,447. There were 16 other bids submitted. (July 21, p. 528.)

COQUILLE, ORE.—A contract for rebuilding the bridge across the Middle Fork of the Coquille River is let to the San Francisco Bridge Co., for $3,842, for a combination bridge on concrete piers. (June 16, p. 436.)

CORNING, N. Y.—W. L. McGeorge, Mayor, will receive proposals Aug. 7 for painting highway bridges. W. T. Smith, Chairman of Public Improvement Committee.

COTTONWOOD FALLS, KAN.—M. C. Newton, Clerk of Chase County, informs us he will receive bids until Aug. 12 for an iron bridge 110 ft. long over Cottonwood River.

CULLMAN, ALA.—The Board of Revenue of Cullman County will receive proposals until Aug. 16 for building a new bridge over Wolf Creek, one mile from Cullman; for a new bridge across Ryon's Creek, near the Sims place; to repair the Sanford bridge on Ryon Creek and to rebuild portions of the iron bridge at the Stoncil Mill.

DALLAS, ORE.—The contract for the Mill Creek bridge on Dallas and Grand Ronde County road, for which bids were received July 17 by the County Clerk, is awarded to C. F. Royal & Son. There were three other bids.

DONALDSONVILLE, LA.—The franchise of the Donaldsonville Bridge Co., reports state, will expire Nov. 1, and after that date the bridge will revert to the town, when numerous and extensive repairs will be made.

DOWNIEVILLE, CAL.—Henry E. Quigley, Clerk of the Board of County Supervisors, informs us that he will receive bids until Aug. 22 for an iron bridge on the present site of the bridge known as the Ann Turner bridge across Slate Creek, one mile west of Port Wine (July 28, p. 544); also for a wooden bridge across the North Fork of Oregon Creek at Forest City; also for a third bridge, for which bids are wanted the same day, across the North Fork of the North Yuba River near Downieville.

DURANT, I. T.—Reports state that bids are wanted for a bridge across the Washita River, 15 miles north of Durant, Choctaw Nation, I. T., the bridge to have a main span of 182 ft., with approaches of 100 ft. each. Address M. D. Sowell.

ELMIRA, N. Y.—Only one bid was received by M. H. Murphy, City Clerk, for the bridge over Hoffmans Creek at Graves St. and that was rejected. The bridge is 100 yards long.

ERIE, PA.—A bridge will be built across Mill Creek and an ordinance is now before the Council to authorize a bond issue of $300,000 to pay the cost.

GALESBURG, ILL.—Captain J. I. Burkhalter of the Road and Bridge Committee of the Board of Supervisors has plans and specifications for the new steel bridge authorized built over Spoon River at Fort Wallace. It will probably cost $3,400.

HAMILTON, MONT.—The Raballi County Commissioners have ordered the following work let by contract: A span to be built to east end of present bridge at Corvallis to be 130 ft. long, style a Howe truss. Four bridges to be built over sloughs over road leading west from Eight mile bridge; bridge No. 1, 30 ft. span; No. 2, 20 ft. span; No. 3, 30 ft. span; No. 4, a 50 ft. span. Also approaches for same. Bridge to be built on South fork of West Fork of the Bitter Root River, a 50-ft. span. Bids to be filed not later than Aug. 7, with the County Clerk.

HELENA, MONT.—The Missouri Valley Bridge & Iron Co. of Leavenworth, Kan., has the contract for the new bridge over the Missouri River at Canyon Ferry at $10,000. The company is finishing a large bridge 50 miles north of Helena. (July 14, p. 512.)

HENRIETTA, TEX.—The Red River & Southwestern Ry. will need bridges over one river and several small streams. Bids will probably be wanted within 30 days. E. B. Carver, Secretary and General Manager.

HILLSBORO BRIDGE, N. H.—The Berlin Iron Bridge Co. has the contract at $5,260 for the proposed new bridge on Henniker Road, for which bids were submitted July 11. A. A. Harrington received the contract on a bid of $2,400 for a wooden bridge.

HULL, QUE.—The by-law for building a new bridge over Brewery Creek was defeated in the City Council. (June 30, p. 480.)

INDIANAPOLIS, IND.—The City Council on July 24 passed the ordinance appropriating $150,000 for the following new bridges:

Steel-girder bridge over White River at Washington St.; estimated cost, $40,000.

Steel bridge, probably Melan arch, over Fall Creek at Illinois St.; estimated cost, $20,000.

Stone bridge over Fall Creek at Meridian Ct.; estimated cost, $40,000.

Steel bridge over Fall Creek at Indiana Ave.; estimated cost, $20,000.

Steel bridge over Pogue's Run at Pine St.; estimated cost, $4,000.

Steel bridge over Pogue's Run at Market St.; estimated cost, $6,000.

Wooden bridge over the canal at Washington St.; estimated cost, $1,000.

The County Commissioners, July 21, awarded the contract for building the approaches to the Michigan St. bridge over Little Eagle Creek to Geo. W. McCray, at 17½ cents per cu. yd. The Wrought Iron Bridge Co. has the contract for the superstructure of the new bridge over Lick Creek on the Shelbyville Road at $1,571. Wm. Fife will do the stone work at $7.65 per cu. yd. The New Columbus Bridge Co. will build several small bridges on the Spring Valley Road near Acton, the total cost of which is $1,149. Robbins & Frazer will do the stone work for these bridges at $8.45 per cu. yd. (Shelbyville, July 14, p. 513.)

E. M. Johnson, City Comptroller, will receive proposals until Aug. 22 for the $150,000 of bridge bonds.

IRWIN, PA.—A crossing over or under the Pennsylvania Railroad from Oak St. to North Irwin will be made. G. W. Flowers, Borough Solicitor.

JOLIET, ILL.—Joseph F. Haas, Clerk of the Sanitary District, 1110 Security Building, Chicago, will receive bids until Aug. 20, for building a tow-path bridge on the Illinois & Michigan Canal.

KAMLOOPS, B. C.—A railroad bridge, according to report, 13 miles west of Kamloops, was recently destroyed by fire. It was a Howe truss structure 125 ft. long.

KANSAS CITY, KAN.—Reports state that the Union Pacific and the Chicago, Rock Island & Pacific propose to build a viaduct across the railroad tracks at Armstrong.

KANSAS CITY, MO.—Waddell & Hedrick will prepare the plans for the Agnes Ave. bridge for the Metropolitan St. Ry. Co.

LA GRANGE, IND.—The Commissioners of La Grange County want bids for four bridges with steel spans of the following lengths: 100 ft. 20 ft., 227 ft., each to have stone abutments. C. C. Gilhams, County Auditor.

LEBANON, PA.—The County Commissioners of Lebanon and Lancaster counties will build a bridge over Conewago Creek, according to report.

LEWISTON, IDA.—Ernest McCullough has been granted a franchise to build the proposed toll bridge across the Clearwater River. It will probably be a combination iron and wood structure. (May 26, p. 377.)

LOCKPORT, N. Y.—Reports state that a new bridge will be built over the canal at Chapel St., and that the State Superintendent of Public Works is preparing plans.

LOOMIS, WASH.—Bids will be received by State Road Commissioners of Marble Mount, Sans Poil State road at Ives, Okanogan County, Aug. 12, for building a bridge over the Methow River, Span to be 150 ft. Span on west side, 75 ft. East span, 52 ft. Bridge to be 16 ft. wide. O. A. Hoag, Secretary.

LOS ANGELES, CAL.—Frank H. Olmsted, City Engineer, informs us that all bids received July 17 for the three proposed bridges were rejected, and new bids will be opened Aug. 7. (July 14, p. 512.)

MACHIAS, ME.—The Washington County RR., according to report, will build a bridge near this place.

MARLIN, TEX.—The Commissioners of Falls County have let a contract to Colonel C. Baker of Marlin, to repair three iron bridges damaged by the recent flood. Bids for building three new iron bridges were rejected July 22. Bids will again be received.

MILWAUKEE, WIS.—The bridge at Broadway will be removed to Lincoln Ave., and a new bridge built. The Council is considering the advisability of issuing $90,000 of bonds for a Bascule bridge at Broadway. G. H. Benzenberg, City Engineer.

MODESTO, CAL.—The Hills' Ferry draw-bridge will be 222 ft. long with 100 ft. clear between piers. Bids will soon be wanted. A. S. Dingley, County Clerk.

NORMAL, ILL.—The bridge which the Illinois Central RR. will build across Linden St., south of Normal, will be a plate girder about 40 ft. long. (July 28, p. 545.)

ONEONTA, ALA.—The Commissioners Court of Blount County has let the contract for a new steel bridge at the Crumley Pond to the Alabama Jail & Bridge Building Co., of Jasper.

OTTAWA, ONT.—The County Council, according to report, will build a steel bridge over the Jock River about one mile from Richmond.

OVANDO, MONT.—The County Commissioners have ordered a new bridge built across the Big Blackfoot River near Ovando.

PATERSON, N. J.—Reports state that plans have been submitted by five bridge building concerns for the Main St. Bridge.

PULASKI CITY, VA.—Aug. 15 is the date for receiving proposals for the new 550-ft. bridge across the New River at Tawe's Ferry. Address, C. R. St. Clair. (July 7, p. 497.)

QUEBEC, QUE.—The Dominion Government has presented to Parliament bills for about $6,000,000 in subsidies for railroads. This includes $1,000,000 for the proposed bridge over the St. Lawrence River at Quebec. (April 14, p. 269.)

RANKIN, PA.—Bids will soon be asked for the bridge which the Monongahela St. Ry. will build from Rankin at an estimated cost of $60,000. Wilkins & Davison, Pittsburgh, are the engineers in charge. F. W. Mellon is President of the street railroad.

ROCHESTER, N. Y.—The Supreme Court has ordered that it is not necessary for the Rochester & Irondequoit RR. to build the two proposed bridges over the tracks of the Rome, Watertown & Ogdensburg RR. (July 21, p. 529.)

Reports state that the Seneca Park Commissioners will build a bridge across the lower river to connect the Ridge Road.

ROCKFORD, ILL.—Reports state that a proposed bridge is estimated to cost $25,000. Edwin Main, City Engineer.

SALEM, ORE.—L. C. McCoy and A. I. Frye are a committee appointed to make estimates and consider plans for repairs necessary to the bridge over the Santiam River near Slayton.

SAN ANTONIO, TEX.—The San Antonio & Brownsville Ry. will need three bridges, the longest

of which will be of two spans of about 150 ft. each. H. M. Aubrey, President.

SAN JOSE, CAL.—Only one bid was received July 17 by the Santa Clara County Board of Supervisors for the bridge across the Alametos Creek, and that was by Louis Heckenroth, who received the contract at $1,473.

SCRANTON, PA.—Giles Roberts, S. W. Roberts and John Demuth, Commissioners of Lackawanna County, are preparing plans for county bridges, for which money is asked in the annual appropriation. There will be two in Scott Township, one in Waverly and one at the head of Baylor Pond.

SHARPSBURG, PA.—The Keystone Bridge Co. has the contract from the Consolidated Traction Co. for the bridge to span the Allegheny River between Sharpsburg and Lawrenceville. The bridge will also cross the tracks of the Allegheny Valley and the West Penn railroads. (Nov. 25, 1898, p. 850.)

STOCKTON, CAL.—The Board of Public Works is considering the advisability of constructing a new bridge in place of that on Pilgrim St. over Mormon Channel.

SYRACUSE, N. Y.—The following are the bids received by City Clerk, Geo. J. Metz, July 24, for furnishing material and building a steel girder bridge over the Onondaga Creek at Rich St.: Pittsburgh Bridge Co., $7,335; Massillon Bridge Co., $7,060; Owego Bridge Co., $6,826; Brackett Bridge Co., $6,666; Groton Bridge and Mfg. Co., $6,793; Canton Bridge Co., $6,970; Wrought Iron Bridge Co., $6,710; W. G. Triest, $6,154; Horseheads Bridge Co., $6,818; Havana Bridge Works, $7,036.

For furnishing materials and constructing stone abutments for the proposed bridge over Onondaga Creek at Rich St.: Leamy & Gregg, $3,211.75; Edwin Lodder, $2,922; Mark Hutchinson, $3,074.75; King Bridge Co., $3.296.80; James Mackay, $3,256; John Crabtree, $2,683.50; Henry Ryan, $2,888.50; James Swift and R. Dawson, $2,699.35; John Kelley, $2,649.

TORONTO, ONT.—The York County Commissioners will receive bids for the approaches, and superstructure of a bridge at Rowntree.

A bridge over the Humber River on the Lake Shore Road will be rebuilt at an estimated cost of $13,000. A by-law for this amount was passed by the County Commissioners.

UKIAH, CAL.—Bids for constructing a bridge across the Russian River at the Bailey crossing were opened at follows, July 21: Cotton Bros., main span, $4,110; approaches, per lineal foot, $6; moving old bridge, $150; Healy, Tibbitts & Co., main span, $3,860; approaches, per lineal foot, $4.65 (awarded); Thompson Bridge Co., main span, $4,290; approaches, per lineal foot, $5.30; Pacific Construction Co., main span, $3,950; approaches, per lineal foot, $5.40.

VICTORIA, B. C.—An election was held Aug. 2 to vote on a by-law for a steel or combination steel and stone bridge to replace the present James Bay bridge.

VINCENNES, IND.—The County Commissioners let the contract for repairing the Elliston bridge to the Vincennes Bridge Co. for $3,432. (Jan. 27, p. 71.)

VISALIA, CAL.—All the bids received July 18 by John Cutter, Jr., County Clerk, for a bridge over Tule River, six miles east of Porterville, were rejected. (June 23, p. 459.)

Other Structures.

ALEXANDRIA, MINN.—The Board of Douglas County Commissioners have passed a resolution for building a new jail, and plans and estimates are wanted.

ALLEGHENY, PA.—The Pennsylvania Casting & Machine Co. will build a new plant adjoining the Pennsylvania Car Wheel Co. Joseph W. Rhodes, President.

ATLANTA, GA.—The Georgia State Railroad Commission, according to report, will shortly issue an order requiring the different railroads running into this city to provide suitable depot facilities. The order will apply to the Nashville, Chattanooga & St. Louis, the Southern, the Georgia Seaboard Air Line, the Central of Georgia, the Atlanta & West Point and the Western & Atlantic. Heretofore the roads have used the depot erected on the propety of the State and leased by the Nashville, Chattanooga & St. Louis Railroad.

A second U. S. penitentiary, to cost about $1,000,000, will be built here. Eames & Young, of St. Louis, Mo., are the Architects.

CHICAGO, ILL.—A new public library building, to cost $100,000, will be built in Evanston.

CONYERS, GA.—The Georgia RR. depot, water station and three adjoining buildings were destroyed by fire July 21.

DECATUR, ILL.—Reports state that the Wabash and Illinois Central railroads will build a new passenger station.

DENVER, COLO.—Bonds to the extent of $400,000 are being sold by the city for a new public auditorium. Joel W. Shackelford, President of the Board of Public Works.

GALENA, KAN.—New car shops will be built at Webb City and Galena for the Southwestern Missouri Electric Ry. Co.

INDIANAPOLIS, IND.—The Parry Manufacturing Co., D. M. Parry, President, reports state, will build a plant here.

LANCASTER, PA.—Reports state that the Pennsylvania RR. has completed plans for making changes in the depot in this city.

LAWRENCEVILLE, PA.—The Consolidated Traction Co., reports state, will build a large car barn at this place.

LEAVENWORTH, KAN.—The Kansas City & Leavenworth Electric Ry., reports state, is preparing plans for a power house to be built in Leavenworth.

LOUISVILLE, Ky.—Reports state that Mayor Weaver is considering a site on which to build an armory.

LYNN, MASS.—We are informed that there is no truth in the report that the General Electric Co., of Schenectady, N. Y., will build extensions to the steel plant in Lynn, Mass.

MOBILE, ALA.—The plans for the proposed new union passenger depot in Mobile, reports state, are in the hands of President E. L. Russell, of the Mobile & Ohio. The roads interested are the M. & O., the Louisville & Nashville and the Southern Ry.

MONTREAL, QUE.—The Grand Trunk Railway will build new depots at St. Annes and Vaudreuil, to cost between $14,000 and $15,000.

NEW YORK, N. Y.—Plans are filed with the Building Department for a ten-story brick and terra cotta factory building, 105.4 x 143.2 ft., at the corner of Washington and Banks Sts., for the Western Electric Co., to cost $450,000. Cyrus L. W. Eidlitz, Architect.

Reports state that the Niagara Building, at 135-137 Broadway, will be replaced by a modern 15-story building.

Captain S. E. Allen has reported to the War Department that the buildings at Fort Hamilton have become a disgrace. Many changes will probably be made.

PHILADELPHIA, PA.—Chas. McCaul is asking estimates for building a 17-story bank and office building for the Union Savings Bank & Trust Co., of Cincinnati, O.

Reports state that plans are being prepared for a new building to be built on the northeast corner of Broad and Samson Sts., which will be used for a newspaper publication building.

PITTSBURGH, PA.—A new building will be built at 415-425 Washington St., for Gilchrist & Co. It will be of fire-proof construction, with a steel frame.

The Iron City Metal Co. will build a plant at South Twenty-fifth St., Pittsburgh. J. C. Craff and Harry L. Graham are interested.

RUTLEDGE, PA.—The Chester & Darby Electric Ry., of Chester, Pa., will build a power house at this place, according to report.

SHARON, PA.—Reports state that the Wilkes Rolling Mill Co. will build an addition to its plant which will cost about $40,000.

TORONTO, ONT.—The Grand Trunk Ry., according to report, will build a new passenger station at Queen St.

MEETINGS AND ANNOUNCEMENTS.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Association of General Passenger and Ticket Agents.—The annual convention will be held at Boston, Mass., Oct. 17.

American Society of Civil Engineers.—Meets at the house of the Society, 220 West Fifty-seventh street, New York, on the first and third Wednesdays in each month, at 8 p. m.

American Society of Railway Superintendents.—The annual convention will be held at Detroit, Mich., beginning Sept. 20. C. A. Hammond, Secretary, Asbury Park, N. J.

American Street Railway Association and Street Railway Accountants' Association of America.—The annual convention is set for Oct. 17, at Chicago, Ill. T. C. Pennington, Secretary, 2020 State St., Chicago.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Association of Railway Superintendents of Bridges & Buildings.—The annual convention will be held Oct. 17, in Detroit, Mich. S. F. Patterson, Secretary, Concord, N. H.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7.30 p. m.

Canadian Roadmasters' Association.—The annual convention will be held at Toronto, Sept. 20. J. Drinkwater, Secretary, Winchester, Ont.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 1737, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, Secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month, except during July and August.

Eastern Maintenance of Way Association.—The annual convention will be held Sept. 26 to 29 at Portland, Me. F. C. Stowell, Ware, Mass., Secretary.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Tuesday of each month, excepting July and August, at 6.30 p. m.

Engineers' Club of Columbus, (O.)—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August; at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburg, Pa., on the third Tuesday in each month, at 7.30 p. m.

Locomotive Foremen's Club.—Meets every second Tuesday in the club room of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Master Car & Locomotive Painters' Association.—The annual convention will be held Sept. 12 at Philadelphia, Pa. Robert McKeon, Secretary, Kent, O.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7.30 p. m.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

Roadmasters' Association of America.—The annual convention will be held in Detroit, Mich., Sept. 12. J. B. Dickson, Secretary, Sterling Ill.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

Traveling Engineers' Association.—The annual convention will be held in Cincinnati, O., Sept. 12. W. O. Thompson, Secretary, Elkhart, Ind.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A Sorge, Jr., 1533 Marquette Building, Chicago, is Secretary.

Roadmasters' Association of America and the Road & Track Supply Association Conventions.

The seventeenth annual convention of the Roadmasters' Association of America will be held on Sept. 12, 13 and 14 at Detroit, Mich. The Hotel Cadillac will be the headquarters of the members of the Roadmasters' Association of America, and the Road & Track Supply Association, special rates having been made. Suitable space for the exhibition of supplies has been secured in the hotel, and reservation will be made for those applying to J. Alexander Brown, Secretary and Treasurer, 24 Park Place, New York.

Engineers' Club of Philadelphia.

At a business meeting, June 3, a paper was presented by Mr. George A. Ricker, of Buffalo, N. Y., who described the engineering features of the construction and present method of maintenance of the Niagara Gorge Railroad, the railroad running on the American side of the Niagara River from Niagara Falls to Lewiston. His remarks were illustrated by a series of photographic views enlarged by the electric lantern, and by maps and sections of this road. The details of the construction of this and other roads of similar engineering difficulty were discussed by Messrs. John Birkinbine, James Christie, and others. The first fall meeting will be held Sept. 16.

Texas Railway Club.

The next meeting of the Texas Railway Club will be held at the Tremont Hotel, Galveston, Texas, August 21 and 22. The following papers will be presented: "The Necessity of Regulation of Foundation Brakes from Empty to Loaded Cars," by Mr. W. C. Squire, Mechanical Engineer, Atchison, Topeka & Santa Fe; "Frictional Resistance of Side Bearings and Center Plates of Car Trucks," by Mr. R. M. Galbraith, General Master Mechanic of the St. Louis Southwestern, and "Liquid Air," by Mr. I. B. Kegler, of the Patterson-Sargent Co. Two papers read at the last meeting will be discussed, namely, "The Responsibilities of a Chilled Car Wheel Maker" and "The Relative Merits of Improved Metal Draft Gear."

Railroad Commissioners' Convention.

The Annual Convention of Railroad Commissioners will be held at Brown Palace Hotel, Denver, Colo., August 10. The railroad commissioners of all states and state officers charged with any duty in the supervision of railroads, have been invited to attend and participate in the discussion of such topics as may come before the Convention. The Association of American Railway Accounting Officers has also been invited to attend, or send delegates to the Convention, and join in the consideration of such questions of special interest to that association as may arise. The following are among the topics which will be considered by the Convention: Classification of Construction Expenses; Classification of Operating and Construction Expenses of Electric Railroads; Railroad Statistics; Uniform Classification; Powers, Duties and Work of Railroad Commissions; Legislation; Delays Attendant upon Enforcing Orders of Railroad Commissions; Safety Appliances; Grade Crossings; Plan for Ascertaining the Fair Valuation of Railroad Properties; Permanent Organization.

Society for the Promotion of Engineering Education.

The seventh annual meeting of the Society will be held at Columbus, O., Aug. 17, 18 and 19, in Townsend Hall, Ohio State University. The meeting immediately precedes the annual meeting of the A. A. A. S. Those attending may secure the reduced rate of one and one-third fare for the round trip on the usual certificate plan. Excursions and social entertainments are arranged for outside of the hours of the regular meetings, the programme for which is as follows:

Thursday Morning, Aug. 17.

Reports of officers; election of members; general business.

Address by the President, Thomas C. Mendenhall, President Worcester Polytechnic Institute.

"The Essentials of a Technical Education." By A. L. Rice, Professor of Steam Engineering and Electricity, Pratt Institute.

"The Engineering Educational Value of a Refrigerating Plant." By Wm. T. Magruder, Professor of Mechanical Engineering, Ohio State University.

Thursday Afternoon.

"The Place of Correspondence Schools in Engineering Education." By Edgar Marburg, Professor of Civil Engineering, University of Pennsylvania.

"Advanced Algebra in Engineering and Other College Courses." By F. L. Emory, Professor of Mechanics and Applied Mathematics, University of West Virginia.

"Hydrocarbon Engine Testing Plant of the Ohio State University." By Wm. T. Magruder.

Friday Morning.

Election of members; election of council; general business.

"Teaching Force Assigned to Each Student in the Several Divisions of a Technical College." By J. P. Jackson, Professor of Electrical Engineering, Pennsylvania State College.

"Methods of Teaching: by Text-book, by Lectures, by Laboratory, by Design, by Memoir." By C. F. Allen, Professor of Railroad Engineering, Massachusetts Institute of Technology.

"A Catalogue and Clipping Case." By Wm. T. Magruder.

"Engineering Education and 'Expansion.'" By W. S. Aldrich, Professor of Electrical Engineering, University of Illinois.

Friday Afternoon.

"A Convenient Laboratory Equipment for the Study of Direct Current Dynamos and Motors." By H. B. Smith, Professor of Electrical Engineering, Worcester Polytechnic Institute.

"A Comparative Study of the Electrical Engineering Courses Given in Different Institutions." By F. C. Caldwell, Associate Professor of Electrical Engineering, Ohio State University.

"An Apprentice System in College Shops." By O. P. Hood, Professor of Mechanical and Electrical Engineering, Michigan College of Mines.

"Drawing, Mechanical Laboratory Practice and Shopwork in Engineering Colleges." By H. E. Smith, Assistant Professor of Mechanical Engineering, University of Minnesota.

Saturday Morning.

"The Desirability of Uniformity in the Use of Mathematical Symbols and Terms." By A. E. Haynes, Professor of Mathematics, University of Minnesota.

"The Use of Graphical Methods in the Solution of Problems in Mechanics." By C. M. Woodward, Professor of Applied Mechanics, Washington University.

"On the Nature of Entrophy." By Albert Kingsbury, Professor of Mechanical Engineering, New Hampshire College.

Business meeting.

PERSONAL

(For other personal mention see Elections and Appointments.)

—Mr. J. G. Tomlinson, Superintendent of Motive Power of the New Orleans & Northeastern, was instantly killed by an engine while attempting to cross a track last week.

—Cards have been issued announcing the marriage of Mr. Henry Goldmark, Assistant Engineer of the Engineer Board of Deep Waterways, on Thursday, June 8, to Miss Mary Carter Tomkins, daughter of Mrs. Elliott Dunham Tomkins, of Detroit.

—Hon. Clapp Spooner, for many years connected with the Adams Express Co., died at his home in Bridgeport, Conn., on July 30, at the age of 75. Mr. Spooner's death was the result of an accident which happened three years ago. The deceased was Mayor of Bridgeport in 1865, and from 1887 to 1891 he was Vice-President of the Adams Express Co.

—Mr. Samuel F. Prince, Jr., who on Aug. 1 goes to the Philadelphia & Reading as Superintendent of Motive Power and Rolling Equipment, is a graduate of the University of Pennsylvania. Mr. Price was, prior to 1892, Mechanical Engineer on the P. & R., and in March of that year was appointed Mechanical Engineer on the Long Island, and in 1893 he became Superintendent of Motive Power and Equipment.

—Mr. W. G. Besler, who recently resigned as Superintendent of the St. Louis Division of the Chicago, Burlington & Quincy to accept the position of Division Superintendent on the Philadelphia & Reading, is about 35 years of age. Mr. Besler has practically grown up on C., B. & Q., and is a graduate of the Massachusetts Institute of Technology and a son of Mr. J. D. Besler, who for the past 14 years has been General Superintendent on the same road.

—Rear-Admiral James Entwistle, U. S. N., has been retired for age. Admiral Entwistle was the Chief Engineer in the Olympia in the Manila campaign and therefore Fleet Engineer under Dewey. He returned to the United States in the Raleigh. He retires with the rank of Rear Admiral under the provisions of the personnel bill and a great many people will be glad that this law is bringing long delayed justice to many good engineers and officers.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—D. D. Bailey has been appointed Superintendent of the Panhandle Division, with headquarters at Wellington, Kan. Effective Aug. 1. Charles Dyer has been appointed General Superintendent of the Western Division.

Baltimore & Ohio Southwestern.—The officers of this company, successor to the old company (See RR. News column), are: President, E. R. Bacon; Vice-President and General Manager, W. M. Greene; Secretary, M. V. Wild; Assistant Secretary, Ed. H. Movius; Treasurer, W. E. Jones and General Counsel, Judson Harmon. The Board of Directors are as follows: E. R. Bacon, New York; W. M. Greene, George Hoadly, Jr., J. Chauncey Hoffman, Edward Colston, Edward W. Strong, Cincinnati; Hugh D. McMillan, Aurora, Ind.; E. Colly Pierce, St. Louis, and Frank W. Tracey, Springfield, Ill.

Birmingham & Atlantic.—The officers of this company are: President, Eugene Zimmerman; Auditor, M. O. Guiss; Assistant Treasurer, Geo. Dunglison, and Master Mechanic, B. J. Sitton.

Buffalo, St. Mary's & Southwestern.—B. E. Wellendorf, General Superintendent, has resigned, and that office has been abolished.

Central Vermont.—D. A. Sheedy has been appointed Superintendent of Bridges and Buildings, with headquarters at St. Albans, Vt., succeeding J. O. Olmstead, resigned.

Chicago, St. Paul, Minneapolis & Omaha.—W. H. S. Wright, Purchasing Agent, has resigned.

Cleveland Belt & Terminal.—J. W. Wardwell has been elected President, succeeding A. C. Barstow, resigned. Clarence C. Brown and Henry Humphreys were elected Directors, succeeding E. J. Blanden and Caleb E. Gowen, resigned.

Cleveland, Canton & Southern.—H. R. Moore, General Freight Agent, with headquarters at Cleveland, O., has resigned.

East Louisiana.—Frank B. Hayne has been elected President, with headquarters at New Orleans, La.

Grand Trunk.—Geo. T. Bell has been appointed Assistant General Passenger Agent, with headquarters at Chicago, Ill., succeeding E. H. Hughes, transferred. Geo. W. Vaux has been appointed Assistant General Passenger Agent, with headquarters at Montreal, Que., succeeding Mr. Bell.

Georgia Pine.—J. R. Sharpe has been elected Vice-President, with headquarters at Bainbridge, Ga., succeeding A. L. Hawes.

Georgia, Southern & Florida.—L. B. Rhodes has had his title changed from Foreman Machine Shops to Master Mechanic.

Hutchinson & Southern.—The title of F. H. Carpenter has been changed from Roadmaster to Superintendent Maintenance of Way and Construction.

Intercolonial.—W. A. Dube has been appointed Superintendent of the Montral and Ste. Flavie District, with headquarters at Levis, Que., succeeding A. Ouellette.

Lehigh Valley.—Philip Wallis, Master Mechanic, with headquarters at South Easton, Pa., has resigned to go to the Long Island as Supt. Motive Power.

Long Island.—Philip Wallis, heretofore Master Mechanic of the Lehigh Valley, has been appointed Superintendent Motive Power and Equipment, with headquarters at Long Island City, N. Y., succeeding S. F. Prince, Jr., resigned. Effective Aug. 1.

Los Angeles Terminal.—N. W. Best has been appointed Superintendent Motive Power and Machinery.

Missouri Pacific.—W. G. Nixon has been appointed Purchasing Agent, succeeding A. Gould, deceased.

Mobile & Ohio.—The headquarters of J. N. Seale, Superintendent of Transportation, have been removed from Jackson, Tenn., to Mobile, Ala.

Pacific & Idaho Northern.—F. L. Richmond has been appointed Superintendent, with headquarters at Weiser, Ida. Mr. Richmond will also have charge of the Purchasing Department. (See RR. Construction column, May 26, p. 379.)

Pacific Coast Co.—Hamilton H. Durand, Secretary, has been elected Vice-President, succeeding Wm. H. Porter. J. T. Campion, Auditor, has resigned.

Pennsylvania Co.—A new Division has been created, to be known as the Chicago Terminal Division. This Division will embrace the Pittsburgh, Fort Wayne & Chicago from Clarke Junction, Ind., to and including the City of Chicago and the Cummings Branch; the Calumet River; the South Chicago & Southern; the State Line & Indiana City; the Pittsburgh, Cincinnati, Chicago & St. Louis from Bernice, Ill., to and including the City of Chicago, and the Englewood Connecting Railway. The name of the Chicago Division has been changed to the Logansport Division, and will embrace the Pittsburgh, Cincinnati, Chicago & St. Louis from Bradford Junction, O., to Bernice, Ill., and from Peoria Junction, Ind., to Effner, Ind. The limits of the Western Division will be changed to embrace the Pittsburgh, Fort Wayne & Chicago from Crestline, Ohio, to Clarke Junction, Ind. P. A. Bonebrake has been appointed Superintendent of the Logansport Division, with headquarters at Logansport, Ind. W. C. Loree has been appointed Superintendent of the Indianapolis Division, succeeding P. A. Bonebrake, transferred. C. H. Walton has been appointed Superintendent of the Chicago Terminal Division, with headquarters at Chicago, Ill., effective Aug. 1.

T. W. Demarest has been appointed Master Mechanic, with headquarters at Logansport, Ind., succeeding W. C. Pennock, deceased.

Pittsburg, Bessemer & Lake Erie.—P. A. Hawn has been appointed Supervisor of the Northern Division, with headquarters at Conneaut, O., succeeding E. C. Brown.

San Antonio & Brownsville.—At a meeting of the stockholders, July 19, the following Directors were elected: Chas. Hugo, Frank Grice, Jesse D. Oppenheimer, F. W. Cook, Jr., H. M. Aubrey, J. S. McKinnon, J. M. Nix, H. E. Hildebrand and L. J. Hart. The officers were given last week (p. 547) under Elections and Appointments.

San Francisco & San Joaquin Valley (Atchison, Topeka & Santa Fe).—Edward Chambers has been appointed General Freight Agent and J. J. Byrne has been appointed General Passenger Agent, with headquarters at Los Angeles, Cal.

Seattle & International.—H. E. Danz has been appointed General Freight and Passenger Agent, with headquarters at Seattle, Wash., succeeding F. A. Allen, resigned.

Sebasticook & Moosehead.—A. B. Thompson, in connection with his duties as Receiver, will also act as General Manager and Treasurer, with headquarters at Hartland, Me.

York Southern.—The duties of General Manager are to be assumed by the President, Chas. H. Jones, Jr.

RAILROAD CONSTRUCTION, New Incorporations, Surveys Etc.

ALABAMA ROADS.—An official of the Southern Ry. writes that there is no truth in the report that a line is building or to be built from the Southern near Montevallo north to Dogwood. (June 28, p. 547.)

The Sloss Iron & Steel Co. is building 1½ miles of track from the main line of the Southern to New Found Mine, in Brookside, Ala.

ANN ARBOR.—Right of way is reported obtained for a cut-off around Churchill Hill, near Pomona, Mich.

ANNISTON & COOSA COAL FIELD.—The city of Anniston, Ala., has granted a franchise over certain streets of the city for this line, projected from that city west 26 miles to Ragland, tapping the Coosa coal fields, in St. Clair County. The estimated cost is not to exceed $10,000 a mile. Howard W. Sexton, of Anniston, is an incorporator. (Feb. 10, p. 107.)

ATCHISON, TOPEKA & SANTA FE.—The section of the Kansas, Oklahoma Central & Southwestern from Caney, Kan., to Dewey, I. T., is open for business. Stations are established at Owen and Dewey, with agents in charge. It is to be extended to Bartlesville, in all about 50 miles. (June 23, p. 460.)

ATLANTA & WEST POINT.—The Supreme Court of Georgia has given a decision against building a belt line around Atlanta, Ga., on the ground that consent was not given by all the stockholders. This decision may result in the abandonment of the project. (April 14, p. 271.)

ATLANTIC COAST LINE.—The cut-off between Petersburg, Va., and Stony Creek is reported nearly completed, and trains are now running over some parts of the line. This will shorten the main road about one mile. (May 12, p. 343.)

BALTIMORE & OHIO.—Preliminary surveys are begun, according to report, for an extension from Barberton, O., to run north about eight miles to Copley, connecting with the Northern Ohio.

BALTIMORE & OHIO SOUTHWESTERN.—The improvements between Parkersburg and East St. Louis are being pushed rapidly to completion. Seventeen thousand tons of 85-lb. steel have been put in track and there are still 25,000 tons to come, delivery being delayed on account of rush of orders at the mills. The company has also put in 125 miles of gravel ballast and expects to get out 200 miles more during the season. Many grade reductions and changes in line are being made between Cincinnati and St. Louis. The purpose is to make a uniform one-half of one per cent. grade between Cincinnati and St. Louis, as well as to eliminate a large amount of curvature. At one point, for instance, the line is to be shortened a mile and a half, 360 deg. of curvature eleminated and seven bridges abandoned.

CAROLINA & NORTHWESTERN.—See Railroad News column.

CARROLLTON SHORT LINE.—The people of Carrollton have granted the $12,500 and the 1,000 acres of land asked for by this company to aid in building this line from Carrollton, Ala., northeast 10 miles to Reform, on the Mobile & Ohio. It is expected that the work will be begun within the next 30 days. John T. Cochrane, of Tuscaloosa, Ala., is President. (June 30, p. 482.)

CENTRAL MICHIGAN.—W. J. Brewer, of London, Eng., is in this country in the interest of this proposed line from Grand Haven, Mich., southeast about 350 miles to Fremont, O. J. W. Boyanton, of Grand Rapids, Mich., is President. (Dec. 23, 1898, p. 923.)

CENTRAL NEW YORK & WESTERN.—The New York State Board of Railroad Commissioners has granted to this company permission to build the Central New York & Northern extension north about 55 miles to Macedon on the West Shore line.

Certificates of consolidation of this company with the Central New York & Northern was filed Aug. 1 at Albany. The new company will have a capital stock of $3,500,000. (July 21, p. 531.) (C., N. W. & N., July 28, p. 547.)

CHICAGO & NORTHWESTERN.—The engineer in charge of the extension of the Moville branch of the Northwestern to Sioux City, Ia., has received instructions to lose no time in completing the survey of the new line. The surveyors have been at work the past week surveying a route between Lake City, a point on the main line of Toledo & Northwestern Division of the Northwestern in Calhoun County, to Sac City, a point on the Moville branch, in Sac County. By using this new route in place of the present one by way of Wall Lake, 14 miles will be saved between Lake City and Sac City. It is also understood that a cut-off will be constructed on the Moville branch, from Correctionville to Moville, thus shortening the distance between these two points by 11 miles. When these cut-offs are built and the branch extended to Sioux Sity, the Northwestern will have the shortest line between Chicago and Sioux City. (July 14, p. 515.)

CHICAGO & SOUTHEASTERN.—Track laying was resumed last week, according to report, on the extension from Anderson, Ind., east about 18 miles to Muncie. Much of the grading was completed last year. (June 24, 1898, p. 467.)

CHICAGO, BURLINGTON & QUINCY.—In addition to laying second track on the main line of the Eastern Iowa Division, the company is lowering the heavy grades from Mount Pleasant, Ia., east to Lockridge, 11 miles. A six-mile cut is being made which will be double tracked. Two double track bridges are being built between these points, one over Skunk River, 1,000 ft. long, and the other over Big Creek, 400 ft. long. From Lockridge west to Fairfield some slight changes in the grade will be made. From Fairfield to Batavia, 12 miles, surveys are made and contracts let for building an entirely new line, which is to be double track. West of Ottumwa a double track bridge is to be built over the Des Moines River. When completed, the double track will extend from Mount Pleasant, Ia., west to Chariton, 120 miles. (April 28, p. 305.)

CHICAGO, MILWAUKEE & ST. PAUL.—Officials of this company have decided to relay the track of the Western Iowa Division, between Sioux City and Manilla, Ia., about 75 miles, replacing the 60-lb. by 75-lb. rails.

COLORADO, TEXAS & MEXICAN.—Location surveys are completed for the entire distance from Abilene to Haskell, Tex. It passes through Anderson, 23 miles; Stamford, 13.6 miles, to Haskell, 15.25 miles, in all 51.85 miles. The line is projected from Denver south, via Haskell, Tex., and Llano to Eagle Pass, the gateway to Mexico. It is successor to the Colorado Valley, portion of which is completed. John M. Blackburn, of Abilene, Tex., is Chief Engineer. (May 19, p. 359.)

COLUMBUS, MARSHALL & NORTHEASTERN.—The contractor for this line, referred to last week (p. 547), is John Seymour, of Hudson, Mich. The line is projected from Marshall, Mich., north about 140 miles via Olivet, Kalamazoo, Vermontville and Alma to Bay City. The contract extends to the Grand Trunk crossing at Olivet. Grading is reported in progress. H. E. Hollon, of Marshall, Mich., is President.

CONSOLIDATED TERMINAL.—This company was incorporated in Pennsylvania July 28, with a capital stock of $70,000, to build a line from a point in the 23d Ward of Pittsburgh to run south about seven miles to Fair Haven, on the Pittsburgh & Castle Shannon. The incorporators are: G. E. Hoffmeister, of Allegheny (President); A. C. Strickland, B. C. Hovis, C. W. Scheck and John N. Chester, of Pittsburgh; H. B. Rhine, Bellevue, and William E. Tustin, Allegheny.

DAKOTA PACIFIC.—W. T. Coad, of Rapid City, S. D., has returned with a statement that he has secured sufficient funds for completing the line from that city west 33½ miles to Mystic, on the Chicago, Burlington & Quincy. (June 23, p. 461.)

DAVENPORT, CLINTON & EASTERN.—The contract for building the road from Davenport northeast to Clinton, Ia., has been awarded to McDonald &

Kennedeck, of New York. The construction of the road is to begin at an early date and the road is to be turned over to the company at the close of the year. This road is a part of the Crescent Bridge & Terminal Co.'s projects. The right of way at Davenport and Clinton, as well as at all intermediate points, has been practically secured. The building of this road has long been contemplated and may mean the entrance of the Chicago & Northwestern into Davenport. (June 9, p. 417.)

DELAWARE & HUDSON.—Contracts are let, according to report, for the section between Waymart, Pa., and the Erie's line, about five miles. The D. & H. Co. will rebuild the section between Carbondale and Honesdale with its own forces. (July 7, p. 499.)

DETROIT RIVER TERMINAL.—Surveys are not completed yet for this proposed line from Detroit, Mich., south 17 miles through Delroy, Rougeville, Ecorse, Ford City, Wyandotte, Sibleys and Trenton to Slocum's Junction. (July 14, p. 515.) The officers are given under Elections and Appointments. (Official.)

DULUTH & NORTHERN MINNESOTA.—Press reports state that 15 miles of track is laid on this line from Knife River, Minn. ,into timber lands. Alger, Smith & Co., of Detroit, are building the line, and Martin S. Smith of that company is President. (Jan. 6, p. 15.)

EASTERN OKLAHOMA.—This company was incorporated in Oklahoma July 24, by officers of the Atchison, Topeka & Santa Fe, to build three new lines in Oklahoma:

Line No. 1 from a point on the Santa Fe main line at or near Guthrie, to run east 60 miles to a point on the border line of the Creek Nation.

Line No. 2 from a point on the Santa Fe between Bliss and the Salt Fork of Arkansas River, to run southeast 65 miles through Pawnee to a point on the north line of the Creek Nation, near the junction of the Cimmaron and Arkansas Rivers.

No. 3 from a point on line No. 1 in Pawnee County, to run northeast via Stillwater to Pawnee and Pawshuka, to connect with the company's Kansas, Oklahoma Central & Southwestern line at Bartlesville, I. T.

ENID & TONKAWA.—Incorporated in Oklahoma with a capital stock of $60,000, by officers of the Chicago, Rock Island & Pacific, to build the proposed line from Enid east 51 miles to Tonkawa. (C., R. I. & P., July 28, p. 547.)

ERIE.—Surveys are reported in progress for a cut-off between Kent, O., and Galion, which will do away with a number of heavy grades and considerably shorten the line.

Surveys are also reported in progress for a cut-off near Geneva, N. Y., to get lighter grades.

FOREST CITY & GETTYSBURG.—This company is incorporated in South Dakota and has bought the track of the old Forest City & Sioux City and proposes to build from Gettysburg, S. D., west 18 miles to Forest City.

FORT TOWNSEND SOUTHERN.—An extension is to be built, according to report, from Quilcene Township, southwest 12 miles to tap timber lands belonging to Clark & Brown.

GEORGIA & ALABAMA.—Over 700 men are reported at work on the terminus on Hutchinson Island, across the river from Savannah, Ga. L. R. Wright, of Macon, Ga., has the contract. (June 9, p. 417.)

ILLINOIS CENTRAL.—Right of way is practically secured for the Canton, Aberdeen & Nashville extension from Winfield, Ala., southwest 58 miles via Vernon, Ala., and Caledonia, Miss., to West Point, on the I. C. It is expected that work will be begun soon. The line was finished this year from Winfield to New River, about nine miles. (June 16, p. 439.)

INDIANA ROADS.—Beckman Bros. of Ferdinand are reported interested in a railroad from that city to run east about eight miles to the Louisville, Evansville & St. Louis Consolidated. Right of way is secured and the people of Ferdinand Township will be asked to vote a 2% tax.

IOWA CENTRAL.—Rails are laid into Kanawha, Ia., on the extension from Belmond northwest 28 miles to Algona. (July 14, p. 515.)

KLONDIKE MINES.—This company has been incorporated in Illinois with a capital of $1,000,000 to build a single or double line from Klondike City along the Klondike River to Bonanza Creek, thence to the divide, Dominion Creek, Indian River and the Yukon River to Dawson City, and it may construct branch lines on Klondike River, Hunker Creek, Beau Creek, Quartz Creek, Sulphur Creek, Eldorado Creek and other creeks. The main office will be at Ottawa, Ill.

LEHIGH VALLEY.—Right of way has been obtained, according to report, for a branch of this company's line to run southwest about 30 miles into the city of Williamsport, Pa.

An official writes that the company does not contemplate at present the loop extension from Plainfield, N. J., to South Plainfield, as recently reported. (July 28, p. 547.)

LITTLE ROCK & HOT SPRINGS WESTERN.—Incoroporated in Arkansas by S. W. Fordyce, of Kansas City, Mo., Receiver of the Kansas City, Pittsburgh & Gulf, John C. Lonsdale, of Hot Springs, Receiver of the Little Rock, Hot Springs & Texas, and others. Mr. Fordyce is President of the new company and Mr. Lonsdale Vice-President.

LOUISVILLE & NASHVILLE.—The Middle Tennessee & Alabama extension is completed to within 16 miles of Decatur, Ala. Work has been suspended for a short time on account of the suit for $8,000 back taxes in Limestone County. This suit is only technical and work will be resumed as soon as it is settled.

LOWELL & HASTINGS.—Much grading has been done on the Grand Rapids, Belding & Saginaw line, which, when completed, will give that company a through line from Greenville, Mich., through Montcalm, Ionia and Kent counties to Belding and Lowell. It is expected to complete the road this fall. (May 5, p. 323.)

MENOMINEE & ST. PAUL.—The route of this proposed line is from Menominee, Mich., on Green Bay, to run west 297 miles via Andigo, Merrill and Medford, Wis., to St. Paul, Minn. The company was organized in June last. Henry W. Ashley, General Manager of the Ann Arbor, is a director; Samuel M. Stephenson of Menominee is President. The company is also making arrangements, according to report, to begin building a belt line around the city of Menominee. (June 23, p. 461.)

MISCELLANEOUS COMPANIES.—The American Railway Construction Co. has been incorporated in New Jersey, with a capital stock of $100,000, to build and operate railroads. The principal office is the Corporation Trust Co., Jersey City, N. J. Among the incorporators are Aaron F. Chapman, John L. White, Daniel Searles, Jr., and Frank A. Sawyer.

MISSISSIPPI VALLEY.—Surveys are reported completed from East St. Louis, Ill., to Alton, on this proposed line from East St. Louis south 145 miles along the Mississippi to Cairo. Spencer Tompkins, of 927 Olive St., St. Louis, is Secretary and Attorney. (Jan. 6, p. 16.)

MISSOURI MIDLAND.—Grading is practically completed, according to report, on this line from Columbia, Mo., to Kennard, on the Missouri, Kansas & Texas, 8½ miles. Chas. Wiggins, of St. Louis, Mo., is President. (May 5, p. 323.)

MOBILE & OHIO.—The first regular train over the Mobile & Bay Shore line from Pritchards, Ala., southwest to Portersville, on the Gulf of Mexico, was run July 28. (July 28, p. 547.)

MOSCOW & EASTERN.—Locating surveys are reported completed for this line from Moscow, Id., east 35 miles to Collins. It is stated that building is to be begun at once. George Creighton is President, and C. O. Brown, General Manager, both of Moscow, Id. (June 2, p. 392.)

NEW YORK CENTRAL & HUDSON RIVER.—Grading is in progress on the connecting line from the New York Central at Hoffman's, N. Y., to the West Shore at Rotterdam. This includes about two miles of new track, a bridge across the Mohawk and the elevation of the connecting tracks over the main line.

OHIO RIVER JUNCTION.—Final surveys are reported completed for this line from Rochester, Pa., northeast about 16 miles to Callery Junction on the Pittsburgh & Western. Jas. P. Leaf of Rochester is Engineer. (March 11, 1898, p. 188.)

OKLAHOMA & GULF.—Incorporated in Oklahoma with a capital stock of $3,000,000 to build a railroad from the counties of Chautauqua and Cowley, Kan., south through the Osage Reservation, the counties of Pawnee, Payne, Kingfisher and Canadian and the Kiowa and Comanche reservations, in Oklahoma, to the County of Wilbarger, Tex., presumably to a connection with the Fort Worth & Denver City. The incorporators are: H. C. Hanna, O. M. Lancaster, J. M. Coulter, C. J. Wrightman and J. K. Berry.

OKLAHOMA CITY & WESTERN.—Incorporated in Oklahoma, with a capital stock of $3,000,000, as an extension of the St. Louis & San Francisco. The proposed route is from Oklahoma City southwest through the Chicasaw Nation to Green County.

OREGON SHORT LINE.—Corey Bros. & Co., of Ogden, Utah, have the contract for the St. Anthony branch from Idaho Falls., Ida., northeast 39 miles to St. Anthony, on the Snake River. Grading is reported begun. (July 14, p. 515.)

PENNSYLVANIA.—Improvements to cost over $500,000 are under way between Baltimore and Washington. The track is to be ballasted with stone in place of gravel, to be relaid with 100-lb. rails, replacing 85-lb. rails, and to have a number of local improvements, such as new freight tracks, and interlocking at Bowie, Md.

PENNSYLVANIA CO.—A spur is to be built at South Bend, Ind., according to report, connecting the Terre Haute & Logansport with the Indiana Northern, owned by the Oliver Chilled Plough Co., and the Chicago & South Bend, owned by the Studebaker Bros. Mfg. Co.

PENSACOLA & NORTHWESTERN.—The Pensacola, Fla., City Council has granted a franchise to this company for this proposed line from that city north 432 miles to Memphis, Tenn. O'Brien & Sheehan of 253 Broadway, New York, have the contract. Grading is to be begun soon. S. N. Van Praag of Pensacola is President. (June 16, p. 439.)

PITTSBURGH, WESTMORELAND & SUMMERSET.—This company has been incorporated in Pennsylvania to build the Byers-Allen Lumber Co.'s line now under construction from Ligonier, Pa., the terminus of the Ligonier Valley, to run southeast seven miles via Mechanicsburg to Laurel Hill. J. Henry Cochran, of Williamsport, is President, and Capt. N. Byers, of Williamsport, General Manager. ((Pennsylvania Roads, June 9, p. 417.)

RED RIVER & SOUTHWESTERN.—About 30 miles is graded to Archer City, Tex., on this line from Henrietta southwest 132 miles via Archer City and Throckmorton to Abilene on the Texas & Pacific. Contracts will be let for grading, etc., within 30 days, and bids will be asked for rails and rolling stock at about the same time. There will be bridges across one river and several small streams. (July 21, p. 531.) E. B. Carver of Henrietta, Tex., is General Manager. (Official.)

RICHMOND, PETERSBURG & CAROLINA.—About 12 miles of track is laid in the vicinity of Ridgeway, N. C. The track will not be laid between Petersburg and Richmond for three months, according to the statement of an official, but it is expected to have the entire line between Petersburg and Richmond built and in operation by Jan. 1. It is controlled by the Seaboard Air Line. (July 14, p. 515.)

ST. CROIX & DULUTH.—Track laying is reported begun on the eight-mile extension of the Empire Lumber Co.'s line from the St. Croix River, in Douglas County, Wis. N. Mills, of Dedham, Wis., is Superintendent. (June 23, p. 461.)

SAN ANTONIO & BROWNSVILLE.—Survey is completed and the company will be ready for bids within three weeks on this line from San Antonio, Tex., south about 275 miles to Brownsville. The heaviest grade is 0.88 per cent., and for over 100 miles the grade is less than 0.02 per cent. There are only three bridges of importance, one of two spans of about 150 ft. each, and the other small and of cheap construction. (July 28, p. 548.) H. M. Aubrey, of San Antonio, Tex., is President. (Official.)

SANTA FE, PRESCOTT & PHOENIX.—This company is completing a spur to the Amalgamated Smelting & Refining Works at Prescott, Ariz.

SIERRA OF CALIFORNIA.—Campbell & Buckman of San Francisco, according to report, have the contract for the branch from Jamestown, Cal., northwest 19 miles to Angels Camp. Grading was to be begun last week and the line is to be completed in five months. (July 14, p. 515.)

SMITHFIELD & MASONTOWN.—The route of this company which was incorporated in Pennsylvania July 18, with a capital stock of $110,000, is from Smithfield to Masontown, 11 miles. The incorporators are: John P. Brennen, Scottdale, Pa.; A. Plumer Austin, Alonzo C. Hagan, Isaac Hunt, William W. Parshall and Samuel P. Boyd, Uniontown, Pa. (July 28, p. 544.)

TIFTON & FLORIDA.—This company was incorporated in Georgia with a capital stock of $100,000 to build a railroad from Tifton, Berrien, to run southwest through the counties of Berrien, Worth, Colquitt, Thomas, Mitchell and Decatur. The incorporators are: J. T. Hill, S. J. Hill, J. Gordon Jones, W. B. Seymour, William Scandrett, P. H. Willis, B. F. Sheppard, J. B. Ryals, F. H. Bland and J. Slade, Jr., all of Dooly County, Ga.

UNION PACIFIC.—Final arrangements have been completed between the officials of this company and those of the Chicago, St. Paul, Minneapolis & Omaha line of the Chicago & Northwestern whereby trains of the former will be run over the tracks of the latter from Columbus, Neb., to Sioux City, Ia., a distance of 126 miles. This train service was to be established Aug. 1. The trains will be operated under the supervision of General Superintendent P. J. Nickols, of Omaha. The depots and terminals of the Sioux City & Pacific at Sioux City, now under the control of the Northwestern, will be used until the erection of the proposed new Northwestern depot, for the Northwestern, Sioux City & Pacific, Elkhorn and Union Pacific roads.

VALDOSTA SOUTHERN.—Location is completed for the extension from Sanderson, Ala., south 10 miles to Madison. The company is slowly building the line. J. M. Wilkinson, of Valdosta, Ga., is President.

VIRGINIA & SOUTHWESTERN.—This company, which, on Feb. 1 acquired the Bristol, Elizabethton & North Carolina, and the South Atlantic & Ohio, is making improvements on both divisions. Many improvements were needed to put them in a safe and proper condition to handle the large tonnage of the Virginia Iron, Coal & Coke Co., which owns the railroad. The Virginia Iron, Coal & Coke Co., within the past six months has bought practically all the furnaces in southwestern Virginia, each Tennessee and Kentucky, including the Bristol furnace, those at Johnson City and Embreeville, Tenn., the Watts furnaces and steel plant at Middlesboro, Ky., and about 300,000 acres of coal and timber lands in southwestern Virginia, east Tennessee and Kentucky. It also has foundries and machine shops at Embreeville, Pulaski and Middlesboro.

The betterments on the railroad consist in putting down 85-lb. new rails on the Virginia Division at Walkers Mountain, where there are 20 deg. curves and 3½% grades. The company is also using over 1,500,000 ft. of timber in repairing and strengthening bridges; 50,000 rail braces will also be used on all curves over 4 deg. The road will be ditched from end to end. The track is to be lined and surfaced, and in some places stone and slag ballast will be used. New stations will be built. The old cars acquired with the property are being overhauled and repaired. One hundred new coal and ore cars, and 150 new coke cars, ordered February last, are now being operated. Three 80-ton consolidation engines are being built by the Baldwin Locomotive Works, to be delivered during the coming month. The company also contemplates buying three or four more locomotives. The new building consists of a nine-mile extension up Stony Creek to the limonite deposits at the Taylor mines. This has already been graded and is waiting for rails and ties. Work is begun on the 33-mile branch to Mountain City, where the Virginia Iron, Coal & Coke Co. have fine tracts of iron ore. In the course of six months the company hopes to be shipping over 1,000 tons of iron ore per day, including several hundred tons to be mined at the ore banks on Doe Mountain, in Johnson County, Tenn. When these extensions are completed, the company will have about 150 miles of road. The betterments on the line will cost over $300,000, and the additional equipment over $250,000. (Official.)

WADLEY & MOUNT VERNON.—Amendments have been granted to the charter for the extensions from Rixville, Ga., southwest about 140 miles to Valdosta, and from Wadley, Ga., northeast 55 miles to Augusta. It is expected that building will be begun soon. (June 16, p. 440.)

WESTERN MARYLAND.—This company which built a cut-off last year from Hagerstown, Md., north to Quinsonia near Altenwald, Pa., has decided to improve the section of the old line from Quinsonia. The maximum grade on the new cut-off is 37 ft., and it is proposed to build an additional track between Quinsonia and New Franklin, four miles east across the Grindstone Ridge, with the same maximum grade. The contract for grading and ballasting is let to Wade, Burns & Co. of Baltimore, and work is to be begun at once. (Official.)

WYOMING SOUTHERN.—It is expected that grading on this line from Fort Steele, Wyo., south 33 miles along the north fork of the Platte River to Saratoga, will be completed by Sept. 1. Surveys are being made to change the route to avoid building two of the six bridges across the Platte River. Rhodes Bros., of Denver, Colo., have the contract. T. J. Milner of Denver is Chief Engineer. (July 28, p. 548.)

GENERAL RAILROAD NEWS.

ATCHISON, TOPEKA & SANTA FE.—Gross earnings for the year ending June 30 were $40,513,499, the increase having been $1,299,399, or 3 1/3 per cent. Operating expenses decreased $899,654, or 3¼ per cent. The increase in net earnings was $2,199,053, or 5½ per cent. The average miles operated during the year were 7,033, the increase having been 96.6 miles.

BALTIMORE & OHIO.—Brown Bros. & Co., New York, Philadelphia and Boston, and Alexander Brown & Sons of Baltimore, inform holders of Brown, Shipley & Company's certificates of deposit for Baltimore Belt RR. first mortgage 5% bonds, that on and after Aug. 1 they will deliver the new B. & O. first mortgage 4% bonds and make cash payments in accordance with the terms of their circular of June 30 last. (July 7, p. 500.)

BALTIMORE & OHIO SOUTHWESTERN.—The transfer of the property to the newly reorganized company was made at midnight, Monday, July 31. The articles of incorporation were filed in Ohio Monday. The officers of the new company are given under Elections and Appointments. (July 28, p. 543.)

Articles of incorporation have been filed in Illinois for the St. Louis, Springfield & Vincennes to operate a section of this line from North Indiana west to St. Louis and Chawneetown to Springfield, Ill. The Cincinnati, Portsmouth & Parkersburg has been incorporated in Ohio with a capital stock of $2,000,000 to operate sections on the line in Ohio.

BOSTON & ALBANY.—The directors, after a meeting held in Boston July 27, issued a statement with reference to the proposed lease of this property to the New York Central & Hudson River. They ask for proxies from stockholders in support of their plan, and state that under the proposed lease the stockholders will undoubtedly receive 8½% per annum, or, if the reserve of $4,000,000 is sold, an 8% dividend and an immediate cash payment of $16 per share. They affirm that under the terms of the lease, which provides that the lessees shall pay the taxes on the shares, more will accrue to the stockholders than would in an exchange for 3½% bonds at $300 per share, or for a cash sale of the stock at the same amount. They call attention to the fact that the gross income has fallen from $10,169,175 in 1893, to $9,241,568 in 1898, and yet the work performed was much greater in 1898 than in 1893 as measured by train mileage or by tonnage. They also call attention to the rapid extension of electric street lines whose passenger business has already seriously affected the line.

Various criticisms are answered at considerable length. An 8½ per cent. security is now worth about as much as a 10 per cent. security was ten years ago. As soon as the Boston & Providence road was leased to the Old Colony at 10 per cent. the stock of the former was quoted at 260¾; Boston & Albany stock is now selling at about 260. If the Central issued bonds at 3½% to pay for the stock at 300, the bonds would require $625,000 a year more from the business of the road; and next after the stockholders the directors are under obligation to the public. In view of the present competition for business between the several seaports the directors are confident that the stockholders could not hope for as good an income under an independent management of the road as they will secure under this lease. The directors believe that the New York Central can do more to develop traffic along the line than an independent management would be able to or could afford to. Sixty per cent. of their tonnage and 62 per cent. of their revenue are derived from an interchange of traffic with the New York Central.

The claim that the road might pay 10 per cent. instead of 8 is met by citing the policy of the Pennsylvania, the New York Central, the Lake Shore and the Northwestern which spend their earnings liberally on betterments. Moreover, the road is not finished. Twenty-four years ago the directors of the Boston & Albany expressed the opinion that the road had reached such a state of completion that comparatively small expenditures upon it would be needed for the future, and more of the earnings might be divided among the stockholders; but, nevertheless, large expenditures had been necessary every year since then, and in comparison with other high class roads its condition is now no better than it was then, and every year in the future will call for large expenditures.

The lessee is to keep the road in good condition, and no new bonds can be issued without the permission of the Massachusetts state authorities. The organization will be kept up and the annual meetings will be held at Boston as heretofore. [This clause will please the hundreds of women stockholders who take a free ride to Boston, value $2 to $10, every September, to do their shopping and do not attend the meeting; but the directors make the announcement without a trace of a smile.] Nine of the directors, all but one of those qualified to act, believe that they have made the best obtainable bargain.

President Bliss tells the newspapers that eastbound shipments from the New York Central equal 185 tons for every 100 tons of westbound to the Central. The Central is in a position to take the products of the West to the Atlantic seaboard as cheap, if not cheaper, than any other railroad in the country. It can haul freight trains made up of from 60 to 70 cars, while many of the other roads could not handle more than half this number in a single train. The Boston & Albany can take no more than 30 loaded freight cars across the Berkshire hills at a single haul, a fact that has an important bearing upon its revenues, as compared with the New York Central. There has been a downward movement in tariffs for the past 20 years, and the bottom has not been reached. These changes will continue on their present course so long as it is possible to effect new economies in the methods of transportation, and the Boston & Albany should be in a position to accept its proportion of these through charges. Strength to line up with competitive roads can best be obtained through the Central's control of its eastern connections, as in the event of rates reaching a basis where it would be unprofitable for the Boston & Albany, with its short haul and limited trains, to accept its proportion, the difference could be absorbed by the Central, and still leave to the latter, because of its splendid facilities, a margin of net revenue. In its relations to the public, continued President Bliss, the Boston & Albany cannot afford to permit competing lines to make better terms with shippers than are applicable over its own system. (July 28, p. 548.)

BROOKLYN & BRIGHTON BEACH.—Justice Stover on July 25, in the Supreme Court at Brooklyn, N. Y., appointed Colonel E. L. Langford receiver in the action brought to foreclose the second mortgage. He is already receiver under the first mortgage proceedings. (March 24, p. 219.)

CAROLINA & NORTHWESTERN.—Press reports from Raleigh, N. C., state that this property has been bought by representatives of the Seaboard Air Line and is to form part of that system. It runs from Chester, S. C., northwest 109 miles to Lenoir, N. C. It is further reported that the line is to be made standard gage and extended to a connection with the East Tennessee & Western North Carolina line of the Virginia & Southwestern.

CENTRAL PACIFIC.—This company has been reincorporated in Utah, with a capital stock of $87,000,000, as successor to the old company under the plan of reorganization. Thomas Marshall is named as President.

CHICAGO & ALTON.—A syndicate headed by Goldman, Sachs & Co., has arranged to buy $10,000,000 of the new $40,000,000 3% bonds. (July 28, p. 548.)

CHICAGO, BURLINGTON & QUINCY.—This road reports for the 12 months ending June 30 an increase in gross earnings of $589,262, or 1.4 per cent. The total gross for the fiscal year amounted to $43,389,425. The gain was entirely in passenger and miscellaneous earnings, as the freight earnings fell off in the year to the amount of $1,272,698. Operating expenses increased $273,412, and net earnings increased $396,001.

A Trust mortgage for $85,000,000 has been filed in favor of the New England Trust Co. It is to be used in acquiring old bonds under the reorganization plan and in absorbing new lines and building bridges, notably one across the Mississippi.

CHICAGO, MILWAUKEE & ST. PAUL.—The stockholders, on Sept. 23, will vote on the proposition to merge by consolidation the subsidiary lines in Illinois. This is under a new statute that recently went into effect allowing for incorporations to own railroads in that state.

COLUMBUS, SANDUSKY & HOCKING.—H. M. Butler has been appointed Special Master to determine preferential liens on this property. The report is to be filed on or before Sept. 25, and exceptions will be heard by the Court at Cincinnati on Oct. 12 and 13. (July 21, p. 531.)

KANSAS CITY, PITTSBURGH & GULF.—The $800,000 receiver's certificates, recently authorized by the United States Court, were sold on July 27 to the New York reorganization committee. (May 26, p. 380.)

LOUISVILLE, EVANSVILLE & ST. LOUIS.—The new issue of 4% receivers' certificates is to be for $300,000, and are issued to buy 500 new coal cars. This will bring the total certificates to date to $899,000. (July 7, p. 500.)

NORFOLK & WESTERN.—Gross earnings for the year ending June 30 amounted to $11,827,140, and the increase was $591,017, or 5 per cent. Passenger and miscellaneous earnings increased 8 per cent.; operating expenses increased $53,004, or 1 per cent., and net earnings increased $538,012, or 16 per cent. The expenses were 67 per cent. of the gross earnings and the year before, 70 per cent.

NORTHERN PACIFIC TERMINAL OF OREGON.—The releasing of this property to the Southern Pacific, the Oregon Railroad & Navigation Co., and the Northern Pacific has been arranged on the old terms, each company paying 6% on the Terminal Company's bonds. (July 28, p. 548.)

QUEBEC & LAKE ST. JOHN.—This company defaulted on July 1 in the payment of interest on its £780,000 first mortgage 5% bonds. The 10-year guarantee of interest given to the bonds by the Province of Quebec expired Jan. 1, 1899. The line runs from Quebec north to Lake St. John and Saguenay, 246 miles, of which 40 miles is leased.

RUTLAND.—The stockholders on July 27 ratified the leases of the Ogdensburg & Lake Champlain, the Rutland-Canadian, and the newly incorporated Rutland & Noyan. They guaranteed the bonds of the Rutland-Canadian. (Feb. 3, p. 95.)

SIOUX CITY TERMINAL.—Warwick Hough of St. Louis, Mo., Special Master in Chancery, has set Aug. 22 as the date of the foreclosure sale of this property. (June 9, p. 418.)

SOUTHWESTERN ARKANSAS & INDIAN TERRITORY.—This property is advertised for public auction at Pike City, Ark., on Oct. 10, under the decree of the U. S. Circuit Court for the Western Division of the Eastern District of Arkansas, in the suit brought by the Mound City Boot & Shoe Co. The upset price is $120,000. There will be sold at the same time and place the assets of the co-defendant, the Smithton Lumber Co., comprising saw and planing mills at Pike City, 3,000 acres of pine lands in Pike County and about 17,000 acres of stripped land in Clark and Pike counties, Ark., upset price, $15,000. The railroad runs from Smithton, Ark., to Pike City, 34.39 miles. A receiver was appointed March 9, 1896. (July 1, p. 486.)

SOUTHERN PACIFIC.—The stockholders on July 26 voted to increase the capital stock from $150,000,000 to $200,000,000 as a preliminary step in the final absorption of the Central Pacific. (July 21, p. 532.)

UNION PACIFIC.—Gross earnings for the year end- miles operated were 2,426.12, the increase having been $1,411,982, or 7¾ per cent. The expenses, including taxes, increased $168,978, and the surplus increased $1,243,004, or 17 per cent. The average miles operated were $2,426.12, the increase having been 63.13 miles. This statement includes the Julesburg Branch taken over in February.

UNION PACIFIC, DENVER & GULF.—Justice Beekman in the Supreme Court of New York City has denied the suit of the stockholders to compel the reorganization committee to modify the plan of organization and to make an accounting. (Feb. 3, p. 95.)

WHEELING & LAKE ERIE.—Brown Bros. & Co., and Maitland, Coppell & Co. have bought $5,600,000 of the $15,000,000 4% bonds recently issued to buy the Cleveland, Canton & Southern and the Cleveland, Belt & Terminal properties. They also undertake to refund the W. & L. E. division 5% mortgage bonds into new 4% bonds, according to a plan to be issued in the autumn. (June 30, p. 484.)

WISCONSIN CENTRAL.—The United States Trust Co. announces that on Sept. 1, it will pay principal and interest of the $808,000 receiver's equipment certificates of November, 1898, of the W. C. Co., and the $461,000 of the W. C. RR. Co. (July 28, p. 548.)

WISCASSET & QUEBEC.—On account of default in the interest of the first mortgage 5% bonds of 1896 since Jan. 1, 1898, the Waterville (Me.) Trust Co., as mortgage trustee, has taken action to acquire possession of the property. The intention is, according to report, to lease the road to the present management. The line now in operation is from Wiscassett, Me., north 43.5 miles to Albion. (June 17, 1898, p. 446.)

WYOMING SOUTHERN.—This company, now building a line from Ft. Steele, Wyo., on the Union Pacific, to Saratoga, is reported to have come under the control of the Union Pacific. It is stated that the U. P. has a five-year option on all the stock and on the bonds at par.

TRAFFIC.

Traffic Notes.

The State Railroad Commissioners of South Carolina have promulgated a freight tariff on cotton, to be put in force Aug. 25, which makes rates from 25 to 35 per cent. less than those now prevailing.

The State Railroad Commissioners of Kentucky have declined to order a general suspension of the long and short haul clause of the constitution of that state; but, on the urgent demand of shippers and receivers of freight in Louisville, have suspended the law so far as it applies to freight shipped over the Louisville & Nashville, the Southern and the Illinois Central to or from Louisville, Owensboro, Covington, Maysville, Versailles and other points where water transportation or other competition has to be met. The Commission suspended this law several weeks ago, as regards coal shipped to Louisville.

Fraudulent Tickets.

Several hundred Epworth League excursion tickets are found to have been forged, after they had been accepted as genuine by the union station ticket takers at Indianapolis. The signature of F. C. Donald, chairman Central Passenger Association, was counterfeited, the local joint agency stamp was forged and the perforating stamp was imitated. The purchaser of one of the fraudulent tickets delayed using it one day and the gateman saw that it did not bear the secret word authorized for the day when it was presented; hence the discovery. How can honest people oppose the passage of a law which will stop ticket-scalping and thus put an end to frauds of this kind?—Railway Age.

Chicago Traffic Matters.

Chicago, Aug. 2, 1899.

Notwithstanding the little ripples that are blowing over the surface of the transportation sea, officers of the roads running from this city in every direction are in a happy frame of mind nowadays over the unprecedented business, both freight and passenger, that is being done. The passenger boom cannot be attributed to meetings or conventions, for in speaking of the increases these cheap rate affairs are excluded. The increase is in legitimate, every-day, full fare traffic. Particularly heavy is the passenger business eastbound from Chicago. For three days last week the Erie had to attach extra sleepers to its two through New York express trains. For four days every berth in the New York car was taken on both trains. The Pennsylvania and the Michigan Central are also being put to it for cars to handle their passengers and freight, both east and westbound. Passenger business to the Wisconsin and Michigan resorts is larger than ever before, though that to Michigan is nearly monopolized by the lake lines.

The demand for harvest hands in the Northwest has reached a point where officers of the Chicago-St. Paul lines believe a rate ought to be made to get laborers to the great wheat belts and relieve the farmers. Acting on this conclusion the general passenger agents of these roads have agreed to make a one-way rate of $7 from Chicago to St. Paul and Minneapolis, the rate to be used only for parties of ten or more traveling on one ticket.

By reason of the agreement between the Chicago-San Francisco direct lines not to bid for soldier movements to the Philippines at a rate lower than the net cash land-grant rate, the quartermaster general has invited the Northern Pacific and Great Northern to bid for the business. In case these northern lines get the soldiers the government will send them to Manila by vessels sailing from the north Pacific coast ports.

There is considerable talk nowadays about a change in the style of interchangeable mileage ticket used on the western roads. There are a few persons, just who, nobody seems to know, who appear anxious to oust the Sebastian ticket and substitute another form, without any apparent reason. The Sebastian ticket has been a great favorite with the railroads and the big wholesale merchants of Chicago.

Eastbound shipments of flour, grain and provisions from Chicago and Chicago junctions to and beyond the western termini of the trunk lines for the four weeks ending July 29, amounted to 484,380 tons. This statement includes 32,058 tons of flour, 377,728 tons of grain, and 74,634 tons of provisions. The following table shows the quantities and proportions carried by the respective roads:

	Tons.	P. c.
Baltimore & Ohio	53,673	11.6
Cleveland, Cincinnati, Chicago & St. Louis	27,364	5.6
Chicago & Erie	45,062	8.8
Grand Trunk	20,424	4.3
Lake Shore & Michigan Southern	73,743	15.3
Michigan Central	69,009	14.5
New York, Chicago & St. Louis	33,246	6.8
Pittsburgh, Cincinnati, Chicago & St Louis	58,577	12.2
Pittsburgh, Ft. Wayne & Chicago	72,879	15.0
Wabash	30,553	5.9
	484,380	100 0

Eastbound shipments from Chicago as reported weekly by the Board of Trade, were, for the four weeks ending July 29, 406,181 tons, as compared with 171,091 tons for the corresponding period of last year. This total of 406,181 tons is made up of 25,167 tons of flour and mill stuffs, 231,190 tons of grain, 57,173 tons of provisions, 41,455 tons of dressed beef, and 42,186 tons of miscellaneous freight.

Lake shipments for the four weeks ending July 29 amounted to 351,607 tons.